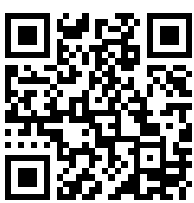
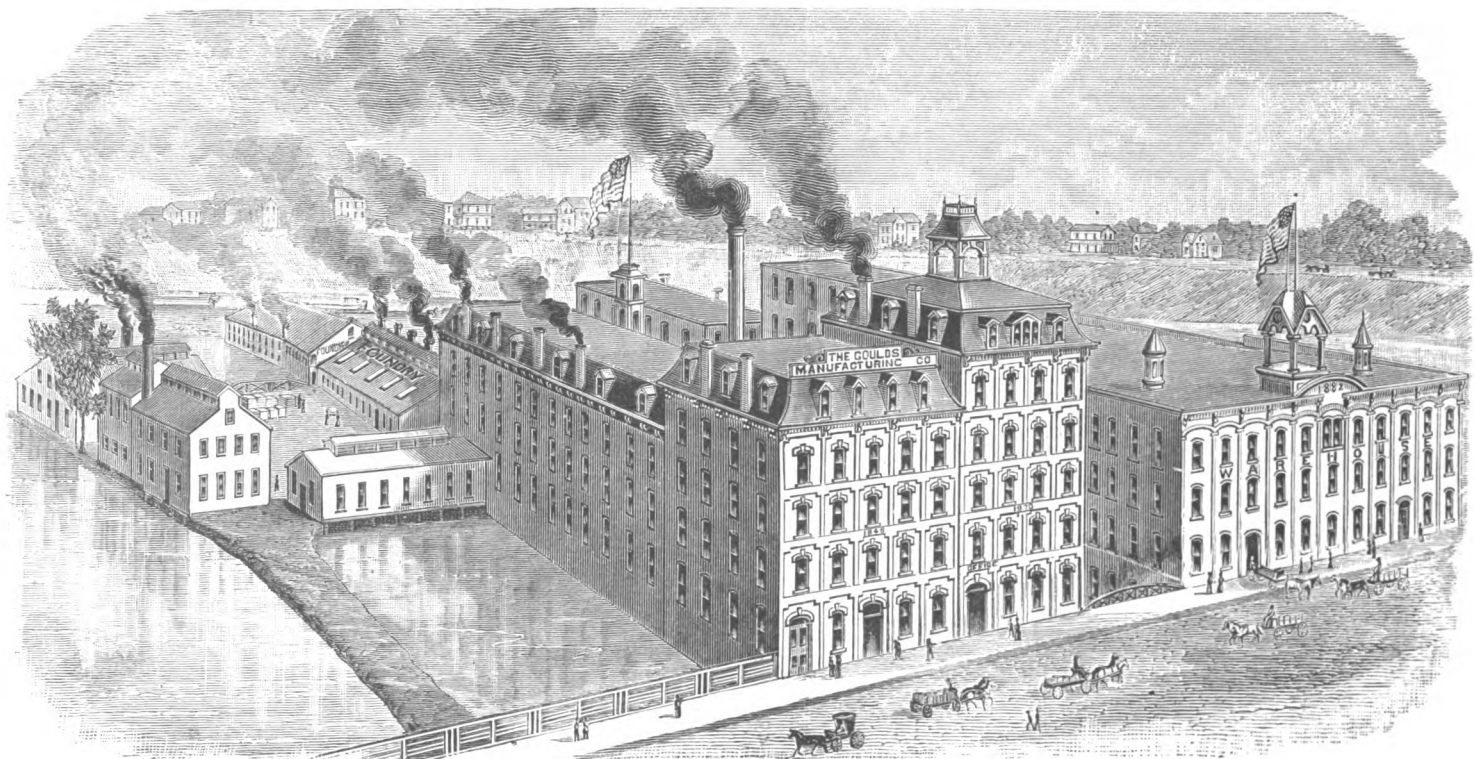
The GOULDS Manufacturing Co.

PUMPS and HYDRAULIC MACHINERY

SENECA FALLS, N.Y.
U.S.A.
1885





PARTIAL VIEW OF THE GOULDS MANUFACTURING CO.'S WORKS, SENECA FALLS, N. Y., U. S. A.

SHOWING ALSO A PARTIAL VIEW OF THEIR NEW WAREHOUSE.

DESCRIPTIVE CATALOGUE

AND

PRICE LIST

OF

PUMPS, ENGINES, RAMS

AND OTHER

Hydraulic Machinery and Iron Goods,

MANUFACTURED BY

THE GOULDS MANUFACTURING CO.

AT THEIR WORKS,

SENECA FALLS, N. Y.

U. S. A.

ESTABLISHED 1848.

PRINCIPAL DEPOT,

NO. 15 PARK PLACE,

NEW YORK CITY, U. S. A.

1885—TWENTY-FOURTH EDITION—1885.

BUFFALO, N. Y.
PRESS OF MATTHEWS, NORTHRUP & CO.
1885.

PARTICULAR NOTICE.

ALL our numerous styles of Pumps, as well as the various sizes of some of our styles, are designated by figures—distinguishing emblems to prevent mistakes. Our Catalogue comprises several hundred separate styles and different sizes of Pumps, and recourse to the above system was rendered imperative some years since, for our own security as well as for the protection of our customers, whose interests will always be promoted by referring to the figure as the description of the article wanted rather than the caption connected with it. The number represents the calibre, size, etc., of article, and should always be mentioned as well as the diameter of cylinder. As we publish several editions of our Catalogue, always refer to the number of the edition and the year issued.

We shall endeavor to be so explicit in the description of the operations and mode of construction and detail of our Pumps, as to make it almost impossible, by the use of ordinary care, to make mistakes in ordering. We wish to be distinctly understood, that we shall always execute orders as per Catalogue unless expressly ordered to do otherwise, in which case a little longer time may be required than if our regular goods were wanted; but no extra charge will be made if only an equivalent is required.

An experience of over thirty-five years is embodied in our goods, and for the majority of average cases they will be found to be essentially just what is wanted, though we will not deny that for particular cases some trifling change might be made to advantage. Our goods are made for the thousands, and some one way which we deem the best must be adopted for building them. If they are wanted in a different way, we want to know what way, and all about it.

While all our Pumps as ordinarily made have the threads cut for American wrought-iron pipe, should any of our foreign customers desire them with the threads cut for English pipe we can so construct them, without any extra charge.

A copious list of repairs will be found in the back part of the Catalogue.

TELEGRAPH CIPHER.

In these days of hurry and bustle time is money. As usual, we are the first to adopt a system which will enable our friends to order goods by telegraph, at slight expense either at home or from abroad.

In connection with nearly every article we make, we have placed a cipher word. This one word describes perfectly what is desired.

A great saving can thus be effected in the expense of sending telegraphic and cable messages.

Cable address,

"GLAVIS," NEW YORK.

SPECIAL NOTICE.

By reference to many of our different styles of Pumps, it will be noticed that in many instances we have changed the numbering of the different sizes. That instead of having a very desultory method of numbering these sizes, we have now some system regarding them so that, when, say, a particular number of Pump is given it carries with it some particular size, the numbering advancing with each one-quarter inch in size of Cylinder, e. g.,

No. 1 Pump means one with 2¼ inch Cylinder.
No. 2 " " " " 2½ " "
No. 3 " " " " 2¾ " "
No. 4 " " " " 3 " "
No. 5 " " " " 3¼ " "
No. 6 " " " " 3½ " " etc., etc.

These changes may lead to some confusion for a time until our patrons become accustomed to them; but the efficacy of such a system of numbering must be apparent to all. We would suggest, therefore, to prevent mistakes, that our patrons, and particularly those in foreign countries, when giving the numbers describing the size of any Pump, that they give the calibre of the cylinder also, in each and every order, and in so doing it precludes any chance of error.

OFFICE OF

THE GOULDS MANUFACTURING CO.

SENECA FALLS, N. Y.

IN THIS, our NEW ILLUSTRATED CATALOGUE AND PRICE LIST, we offer to the favorable notice of the Trade a very large and useful assortment of Suction and Lift Cistern and Well Pumps, Force Pumps, Rotary Force and Fire Pumps, Wind Mill Pumps, Hydraulic Rams, Garden and Fire Engines, Steel Amalgam Bells, Corn Shellers and other iron goods.

We have revised and modernized our prices; made the lists more consistent; discounts more uniform and fewer; descriptions clear and intelligible, and the illustrations as faithful representations of the goods as the most skillful engravers can make them.

Discount sheets will be issued from time to time, as circumstances may require, and supplements will be sent to our customers showing our new goods and prices, as we shall rapidly increase the variety of them, devise new patterns, extend our facilities, add to our work, and continue, as we now are, the largest manufacturers of the line of goods contained in our catalogue in the world.

Liberality of dealing, which has characterized our House, shall continue to be our maxim, and our customers' interests shall at all times be carefully guarded and protected.

With grateful appreciation of past favors we desire a continuance of the same.

Yours respectfully,

THE GOULDS M'F'G CO.

S. S. GOULD, President,
J. H. GOULD, Treasurer,
S. S. GOULD, Jr., Sec'y.

Principal Depot, 15 Park Place, New York City.
Factory, SENECA FALLS, N. Y., U. S. A.
Branch Warehouses: Chicago, St. Louis, London, England.

TERMS:

CASH in sixty days from date of invoice. Goods delivered at our Factory and our New York Depot, or any of our Branch Warehouses.

Goods packed in boxes, etc., will be subject to cost price of packages.

Owing to the unsettled state of the markets, the constant fluctuations in values, and the impossibility of keeping our agents in the country advised of changes, orders will be accepted only at our office.

GENERAL REMARKS APPLICABLE TO THE SUBJECT OF PUMPS.

PUMPS seem to be but poorly understood, even by those whose business it is to sell and set them. If we can, in a small space, contribute any information that will be of general use, we shall take much pleasure in doing so, and consider that right at the very initial page almost of our catalogue is the most appropriate, as well as the most prominent, place to make such remarks as we deem most suitable.

SUCTION PIPE.

By this we mean that portion of the pipe below the lower valves, whether the valves are in the Pump itself or in a cylinder a number of feet below the Pump, yet above the surface of the water. The pipe between the Pump and cylinder we call the connecting pipe.

We never recommend lifting water by the pressure of the atmosphere over fifteen to twenty-five feet, for a variety of reasons. There is no danger of getting suction pipe too large, though much extra power is required and the effectiveness of the Pump impaired by using too small a one. The suction pipe should properly be about half the diameter of the cylinder of the Pump; and when suction pipe is long in vertical height, it should be a trifle larger than this. The size of discharge pipe can be a fraction smaller than the suction pipe in a single-acting Pump, but in a double-acting Pump should be the same size. Great care should be taken to have the suction pipe *absolutely air-tight.*

Suction pipe may extend horizontally almost to any length if air-tight, but in this case, as in that of long vertical pipe, we urge the use of a foot or check valve, provided the pipe is protected from the frost. A large diameter of pipe should be employed in this case also. Turns or elbows should be avoided in both suction and discharge pipes as far as possible.

POWER.

Power is measured by the work performed. A gallon of water weighs about eight and one half pounds; therefore if a pump is passing ten gallons of water per minute, and lifting it one foot, eighty-five pounds per minute of power will be required to do it; lifting it twenty feet, twenty times eighty-five pounds, and so on.

QUANTITY.

In connection with each Pump will be found its diameter and length of stroke. From the table which we give on another page, the exact quantity of water or other liquid that any Pump will give can easily be computed, from which result the amount of power in pounds required will be easily ascertained. The power that one horse theoretically is capable of exerting is equal to raising 33,000 pounds one foot per minute. Recent experiments have, however, shown that the above is exaggerated, and that from a test of several average horses only about 25,000 pounds could be generated from one horse. A man will exert a force equal to from one-fifth to one-third of a horse power, depending on how continuous the effort.

FOR EXAMPLE.

We will illustrate our idea by the following example: A Pump with 6-inch cylinder and 12-inch stroke is lifting water twenty feet through a 3-inch pipe, and forcing it into a tank fifty feet above the Pump, and running at fifty strokes per minute. How much power is required to do the work, and how much water will the Pump give? Refer to table of areas, page 7, and you will find opposite 6 in., 28.274. Multiply this by 12, the length of stroke, and you have the cubic inches of water per stroke — 339.3 cubic

inches. Multiply this result by 50, the number of strokes per minute, and you have the quantity of water raised with fifty strokes — 16,965.00 cubic inches. Divide this by 231, the number of cubic inches in a gallon, and you have 73.7 gallons per minute. Now, to ascertain the power needed to do this, multiply the number of gallons, 73.7, by 8.35, weight of a gallon of water, and you have 615,395 pounds as the weight of water raised. Then multiply this by 70, that being the whole height the water is raised (including distance both below and above the Pump), and divide this result by 33,000 (one horse power), and you have 1,305 horse power as the theoretical power required to raise this quantity of water the distance named. Owing to the friction of water in pipes, and friction of machinery and Pump itself, it would not be discreet to calculate upon less than two horse power to operate a Pump under such circumstances.

In working a double-acting Pump, which is equivalent to two single-acting Pumps of same diameter, double the power would, of course, be required, and double the water would be discharged.

HOT WATER.

No Pump will draft hot liquids any distance, for the reason that the vapor or steam rising from the liquid passes through the suction pipe into the Pump, and fills it with vapor instead of water. Therefore, for pumping hot liquids the Pump should be placed as near as practicable, forcing the liquid upward instead of lifting it by suction. A hot-water Pump always requires metal valves throughout.

RULES.

We, therefore, lay down the following for calculating the capacity of any Piston Pump: Multiply the area of bore of cylinder of Pump by the length of stroke, and that result by the number of strokes per minute the Pump is working. This gives the quantity of water in cubic inches. Divide this by 231, number of cubic inches in a gallon, and you have total capacity of Pump per minute, in gallons and fractions of a gallon. And to ascertain the power required, multiply number of gallons per minute by 8.35, weight of one gallon, and this result by total number of feet water is raised (that is, from surface of the water to the highest point to which the water is raised), and you have the power in foot pounds. Divide by 33,000 and you have the horse power. One horse power is equal to about five men. To the theoretical power a liberal allowance for friction, etc., always wants to be added.

TABLE OF AREAS.

We subjoin a table of areas, from which the area of any Pump can be seen at a glance:

Areas of Circles from 2 Inches to 14 Inches Diameter.

DIAMETER.	AREA.	DIAMETER.	AREA.	DIAMETER.	AREA.
2 inches.	3.1416	6 inches.	28.274	10 inches.	78.540
2¼ "	3.9760	6¼ "	30.679	10¼ "	82.516
2½ "	4.9087	6½ "	33.183	10½ "	86.590
2¾ "	5.9395	6¾ "	35.784	10¾ "	90.762
3 "	7.0686	7 "	38.484	11 "	95.033
3¼ "	8.2957	7¼ "	41.282	11¼ "	99.402
3½ "	9.6211	7½ "	44.178	11½ "	103.869
3¾ "	11.044	7¾ "	47.173	11¾ "	108.434
4 "	12.566	8 "	50.265	12 "	113.098
4¼ "	14.186	8¼ "	53.456	12¼ "	117.859
4½ "	15.904	8½ "	56.745	12½ "	122.718
4¾ "	17.720	8¾ "	60.132	12¾ "	127.676
5 "	19.635	9 "	63.617	13 "	132.733
5¼ "	21.647	9¼ "	67.200	13¼ "	137.886
5½ "	23.758	9½ "	70.882	13½ "	143.139
5¾ "	25.067	9¾ "	74.662	13¾ "	148.489

PARITIES OF EXCHANGE.

For the benefit of our numerous foreign correspondents, we give below our *Parities of Exchange*, showing the value of American money in Pounds Sterling. In making the computation, we have done so on the basis of $4.80 (four dollars and eighty cents) to the £ (Pound Sterling), that being the amount generally realized. We consider these computations a safe average to guide our customers when making us remittances. At the left hand will be found the dollars, while opposite will be their equivalent in Pounds Sterling.

AMERICAN MONEY.	POUNDS STERLING. £1 = $4.80. POUNDS.	SHILLINGS.	PENCE.	AMERICAN MONEY.	POUNDS STERLING. £1 = $4.80. POUNDS.	SHILLINGS.	PENCE.	AMERICAN MONEY.	POUNDS STERLING. £1 = $4.80. POUNDS.	SHILLINGS.	PENCE.
$1		4	2	$41	8	10	10	$81	16	17	6
2		8	4	42	8	15	0	82	17	1	8
3		12	6	43	8	19	2	83	17	5	10
4		16	8	44	9	3	4	84	17	10	0
5	1	0	10	45	9	7	6	85	17	14	2
6	1	5	0	46	9	11	8	86	17	18	4
7	1	9	2	47	9	15	10	87	18	2	6
8	1	13	4	48	10	0	0	88	18	6	8
9	1	17	6	49	10	4	2	89	18	10	10
10	2	1	8	50	10	8	4	90	18	15	0
11	2	5	10	51	10	12	6	91	18	19	2
12	2	10	0	52	10	16	8	92	19	3	4
13	2	14	2	53	11	0	10	93	19	7	6
14	2	18	4	54	11	5	0	94	19	11	8
15	3	2	6	55	11	9	2	95	19	15	10
16	3	6	8	56	11	13	4	96	20	0	0
17	3	10	10	57	11	17	6	97	20	4	2
18	3	15	0	58	12	1	8	98	20	8	4
19	3	19	2	59	12	5	10	99	20	12	6
20	4	3	4	60	12	10	0	100	20	16	8
21	4	7	6	61	12	14	2	200	41	13	4
22	4	11	8	62	12	18	4	300	62	10	0
23	4	15	10	63	13	2	6	400	83	6	8
24	5	0	0	64	13	6	8	500	104	3	4
25	5	4	2	65	13	10	10	600	125	0	0
26	5	8	4	66	13	15	0	700	145	16	8
27	5	12	6	67	13	19	2	800	166	13	4
28	5	16	8	68	14	3	4	900	187	10	0
29	6	0	10	69	14	7	6	1,000	208	6	8
30	6	5	0	70	14	11	8	2,000	416	13	4
31	6	9	2	71	14	15	10	3,000	625	0	0
32	6	13	4	72	15	0	0	4,000	833	6	8
33	6	17	6	73	15	4	2	5,000	1041	13	4
34	7	1	8	74	15	8	4	6,000	1250	0	0
35	7	5	10	75	15	12	6	7,000	1458	6	8
36	7	10	0	76	15	16	8	8,000	1666	13	4
37	7	14	2	77	16	0	10	9,000	1875	0	0
38	7	18	4	78	16	5	0	10,000	2083	6	8
39	8	2	6	79	16	9	2				
40	8	6	8	80	16	13	4				

Dollars and Cents are the terms by which *money* is known and values estimated in America. Twenty-five dollars and forty cents, or forty-hundredths of a dollar (one hundred cents being the equivalent of one dollar) are thus expressed, $25.40, and one hundred dollars by $100.00, and twelve hundred and ten dollars and twenty-five cents by $1,210.25.

The values of the manufactures illustrated in our catalogue are computed in dollars and cents, and we present the accompanying table to enable persons to compare our values with those in English money, which is familiar to most merchants in trade.

WEIGHTS AND MEASURES.

METRIC SYSTEM.

Length.

1 millimeter = .0394 inches.
1 centimeter = .3937 inches.
1 METER = 39.3708 inches.
1 kilometer = 0.6214 miles.

Square.

1 sq. centimeter = .1549 sq. inches.
1 sq. meter = 10.7631 sq. feet.
1 ARE = 119.5894 sq. yards.
1 hectare. = 2.4711 acres.

Cubic.

1 CUBIC METER = 35.3166 cubic feet.

U. S. STANDARD.

Length.

1 inch = 2.5309 centimeters.
1 foot = 30.4794 centimeters.
1 yard = .9143 meters.
1 mile = 1.6093 kilometers.

Square.

1 sq. inch = 6.4513 sq. centimeters.
1 sq. foot = .0929 sq. meters.
1 sq. yard = .8361 sq. meters.
1 acre = .4047 hectares.

Cubic.

1 cubic foot = .02831 cubic meters.

1 U. S. ton of shipping = 40 cubic feet = 32.143 U. S. bushels = 1.1326 cubic meters.

Minimum freight charged on a SS. B|L is on 20 cubic feet.

Weight.

1 gram = 15.4323 grains.
1 KILOGRAM = 2.2046 lbs.
1 tonneau = 2204.55 lbs.

Dry Measure.

1 centiliter = .0181 pints.
1 LITER = .908 quarts.
1 hectoliter = 2.837 bushels.

Liquid Measure.

1 centiliter = .0211 pints
1 LITER = 1.0567 quarts.
1 hectoliter = 26.4176 gallons.

Weight.

1 lb. = .4536 kilos.
1 cwt. = 50.8024 kilos.
1 ton = 1016.0483 kilos.

Dry Measure.

1 pint = 55.0661 centiliters.
1 quart = 1.1013 liters.
1 bushel = 35.2416 liters.

Liquid Measure.

1 pint = 47.3171 centiliters.
1 quart = .9563 liters.
1 gallon = 3.7854 liters.

Table of Power Required to Raise Water from Deep Wells.

Gallons of water raised per hour, ...	200	350	500	650	800	1000
Height of lift for one man working on crank or lever, in feet, ...	90	51	36	28	22	18
Height of lift for one horse working on horse power, in feet, ...	630	357	252	196	154	126

A one horse power steam engine will raise about fifty per cent. more water than a horse working on a horse power.

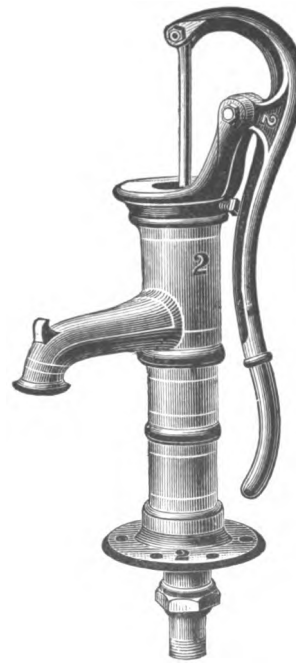
Sizes of Tanks and Contents.

Diameter. Feet.	Depth. Feet.	Gallons.	Diameter. Feet.	Depth. Feet.	Gallons.
12	8	6,767	24	12	40,607
14	9	10,363	26	13	51,628
16	9	13,535	28	14	64,481
18	10	19,034	30	15	79,310
20	10	23,499	32	16	96,253
22	11	31,277	34	17	115,451

REVOLVING TOP CISTERN PUMP.

WITH SCREW BASE. CYLINDER BORED AND POLISHED.

FIG. 198.



The cut represents our Fig. 198, one of several styles of our Cistern Pumps. The base screws up into the bottom of the cylinder instead of being bolted to it, as in all our other Cistern Pumps. In all other respects it is the same as Figs. 199 and 200. We make eight sizes of this kind of Pump as follows. Fitted for lead or wrought-iron pipe, or both, as ordered:

FIG. 198. Sizes, Prices, Etc.

No.	Diam. Cyl'd'r.	Suction.	Capacity per Stroke.	Weight.	IRON.		BRASS.	
					Cipher.	Price.	Cipher.	Price.
0	2 in.	1 in.	1-12 gal.	23 lbs.	Abet	$3.50	Vicarial	$7.75
1	2¼ "	1 "	1-10 "	25 "	Able	4.00	Vicarage	8.75
2	2½ "	1¼ "	1-8 "	27 "	Ably	4.50	Vice	10.50
3	2¾ "	1¼ "	1-7 "	31 "	Abut	5.00	Viceroy	14.00
4	3 "	1¼ "	1-6 "	34 "	Ace	5.50	Viciate	17.00
5	3¼ "	1½ "	1-5 "	37 "	Ache	6.50	Vicinage	21.00
6	3½ "	1½ or 2 "	1-4 "	42 "	Acid	8.00	Vicinal	27.00
8	4 "	2 "	1-3 "	51 "	Acme	10.00	Vicinity	35.00

For prices of brass lower valves and metal packing to adapt these Pumps for hot water, see page 15. The brass Pumps have all parts brass except lever, bearer and base.

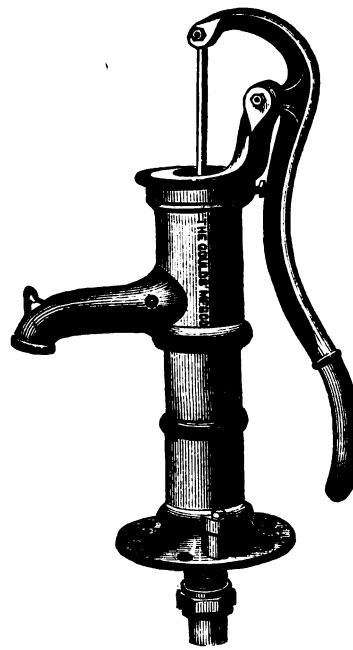
An ordinary hogshead will receive as follows, of this and similar Cistern Pumps:

No. 0 40	No. 4 20
No. 1 36	No. 5 15
No. 2 32	No. 6 12
No. 3 24	No. 8 10

REVOLVING TOP CISTERN PUMP.

WITH BOLT BASE. CYLINDER BORED AND POLISHED.

FIG. 199.



The cut exhibits our Fig. 199, one of several of our styles of Cistern Pumps. The base is almost flat, and not so broad; the brass tube and flange form the valve seat, and are held from turning by projections under the flange; screw threads are cut on the extremity of tube to take wrought-iron pipe coupling where gas pipe is used, or a cast-iron nut with brass tube where lead pipe is used. The plunger is jointed at the top where the rod enters it, and is turned to fit the cylinder closely. The last feature seems to be much preferred by some, though we cannot say that it possesses any advantage over the other kind of plunger. Fitted for lead or wrought-iron pipe, or both, as ordered.

FIG. 199. Sizes, Prices, Etc.

No.	Dia. Cyl.	Suction.	Capacity per Stroke.	Weight.	IRON.		BRASS CYLINDER.		BRASS.	
					Cipher.	Price.	Cipher.	Price.	Cipher.	Price.
0	2 in.	1 in.	1-12 gal.	23 lbs.	Acre	$3.50	Vicious	$5.50	Viduity	$7.75
1	2¼ "	1 "	1-10 "	25 "	Act	4.00	Vicount	6.00	Vie	8.75
2	2½ "	1¼ "	1-8 "	27 "	Add	4.50	Victim	7.00	View	10.50
3	2¾ "	1¼ "	1-7 "	31 "	Afar	5.00	Victor	8.00	Viewed	14.00
4	3 "	1¼ "	1-6 "	34 "	Aft	5.50	Victory	10.00	Viewer	17.00
5	3¼ "	1½ "	1-5 "	37 "	Age	6.50	Victress	13.00	Vigil	21.00
6	3½ "	1½ "	1-4 "	42 "	Aid	8.00	Victuals	18.00	Vigilant	27.00
8	4 "	2 "	1-3 "	51 "	Aim	10.00	Vidual	25.00	Viguet	35.00

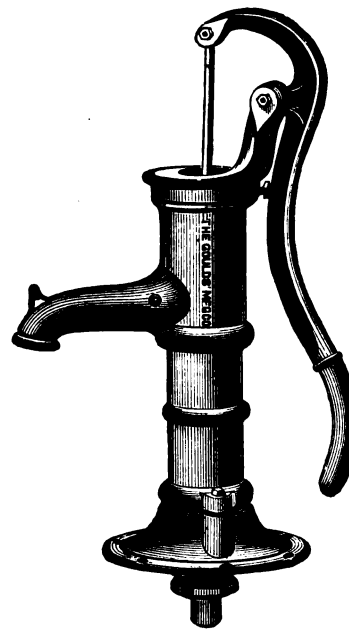
The *brass Pumps* have *all parts brass* except lever, bearer and base.

For price of brass lower valves and metal packing to adapt above Pumps for hot water, see page 15.

REVOLVING TOP CISTERN PUMP.

WITH BOLT BASE. CYLINDER BORED AND POLISHED.

FIG. 200.



The cut shows our Fig. 200, another of our leading staple Cistern Pumps, with broad bearing and high base.

The cylinder and base are held together with two strong bolts, with leather packing between, which have only to be unscrewed to give free access to the lower valve without disturbing the suction pipe in the least. A substantial hub or tail piece on the under side of the base has threads on it for coupling on an iron nut with gas pipe threads cut in it for connecting wrought-iron pipe, while with each Pump is a brass tube of suitable size to pass through the iron nut for soldering lead pipe. One Pump is thus made to answer either of two requirements.

In cold weather lift the lever until the lower valve is tripped, when the water runs out of the cylinder back into the cistern or well.

These Pumps can be used in cisterns or wells, or any place where the water does not have to be lifted to exceed say twenty-five feet in perpendicular height, though horizontally the suction pipe can extend almost any length.

FIG. 200. Sizes, Prices, Etc.

No.	Dia. Cyl.	Suction.	Capacity per Stroke.	Weight	IRON.		BRASS CYLINDER.		BRASS.	
					Cipher.	Price.	Cipher.	Price.	Cipher.	Price.
0	2 in.	1 in.	1-12 gal.	25 lbs.	Air	$3.50	Ember	$5.50	Endow	$7.75
1	2¼ "	1 "	1-10 "	27 "	Airy	4.00	Emboss	6.00	Enjoy	8.75
2	2½ "	1¼ "	1-8 "	31 "	Akin	4.50	Emery	7.00	Ennui	10.50
3	2¾ "	1¼ "	1-7 "	33 "	Alas	5.00	Emit	8.00	Enter	14.00
4	3 "	1¼ "	1-6 "	38 "	All	5.50	Empty	10.00	Entry	17.00
5	3¼ "	1½ "	1-5 "	40 "	Ally	6.50	Enact	13.00	Envoy	21.00
6	3½ "	1½ "	1-4 "	46 "	Alms	8.00	End	18.00	Envy	27.00
8	4 "	2 "	1-3 "	54 "	Also	10.00	Vigor	25.00	Vigorous	35.00

The *brass Pumps* have *all parts brass*, except the lever, bearer and base.

For prices of brass lower valves and metal packing to adapt these Pumps for hot water see page 15.

REVOLVING TOP CISTERN PUMP.

WITH BOLT BASE. CYLINDER BORED AND POLISHED.

FIG. 201.

The cut represents our Fig. 201, another of our Cistern Pumps. It is rather taller than Fig. 200, but equally as strong and substantial, and has always met with much favor at the hands of the trade. As our copious description of Fig. 200 was intended to give a general idea of all our Pumps of this class, we will refrain from further remarks, requesting a reference to that Pump for any further information. Fitted for lead or wrought-iron pipe, or both, as ordered.

FIG. 201. Sizes, Prices, Etc.

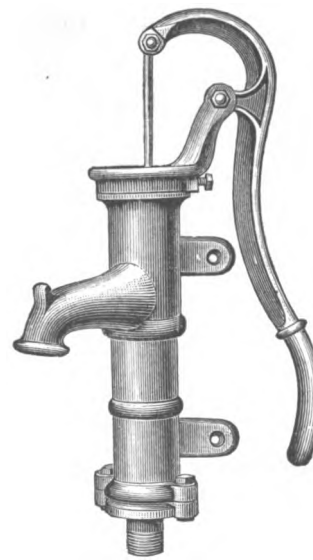
No.	Diam. Cylinder.	Suction.	Capacity per Stroke.	Weight.	IRON.	
					Cipher.	Price.
0	2 in.	1 in.	1-12 gal.	24 lbs.	Alum	$4.00
1	2¼ "	1 "	1-10 "	26 "	Amid	4.50
2	2½ "	1¼ "	1-8 "	29 "	Arc	5.00
3	2¾ "	1¼ "	1-7 "	33 "	Arch	5.75
4	3 "	1¼ "	1-6 "	36 "	Arm	6.25
5	3¼ "	1½ "	1-5 "	39 "	Army	6.75
6	3½ "	1½ "	1-4 "	45 "	Art	8.00
8	4 "	2 "	1-3 "	55 "	Ask	10.00

For prices of brass lower valves and metal packing to adapt these Pumps for hot water, see page 15.

NEW STYLE REVOLVING TOP CISTERN PUMP.

WITH BRACKETS.

FIG. 202 1-2.



The cut, Fig. 202½, represents our new style Revolving Top Cistern Pump, with Brackets. This is, in many instances, a more convenient form than a Pump on base. It can be secured to the wall in any place desired, and made to take the least possible room. It is precisely similar in other respects to our other Cistern Pumps, being fitted with revolving top and bolt fastenings. Fitted for either lead pipe or wrought iron pipe, or both, as may be preferred.

FIG. 202 1-2. Sizes, Prices, Etc.

No.	Dia. Cyl.	Suction.	Capacity per Stroke.	Weight.	IRON.		BRASS CYLINDER.		BRASS.	
					Cipher.	Price.	Cipher.	Price.	Cipher.	Price.
0	2 in.	1 in.	1-12 gal.	24 lbs.	Axe	$3.50	Epic	$5.50	Error	$7.75
1	2¼ "	1 "	1-10 "	28 "	Back	4.00	Epoch	6.00	Erupt	8.75
2	2½ "	1¼ "	1-8 "	29 "	Bad	4.50	Equal	7.00	Espy	10.50
3	2¾ "	1¼ "	1-7 "	33 "	Bag	5.00	Equip	8.00	Etch	14.00
4	3 "	1¼ "	1-6 "	35 "	Bail	5.50	Era	10.00	Ethel	17.00
5	3¼ "	1½ "	1-5 "	37 "	Bait	6.50	Erect	13.00	Ether	21.00
6	3½ "	1½ "	1-4 "	43 "	Bake	8.00	Err	18.00	Ethic	27.00

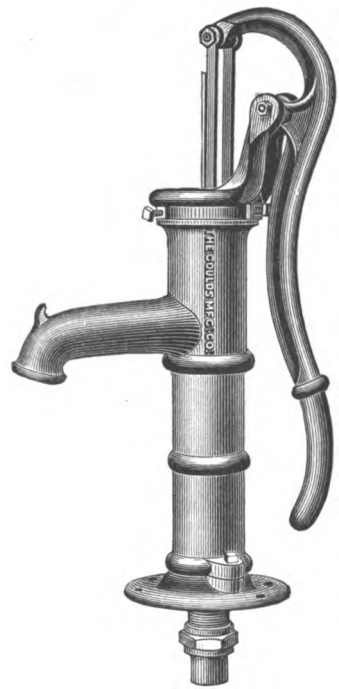
The *brass Pumps* have *all parts brass*, except the lever, bearer and base.

For prices of brass lower valves and metal packing to adapt above Pumps for hot water see page 15.

DOUBLE ROD REVOLVING TOP CISTERN PUMP.

WITH BOLT BASE. CYLINDER BORED AND POLISHED

FIG. 210.



The above cut shows one of our Cistern Pumps, with double rods and guide rod. So constructed they work with more uniform stroke, and are, on this account, much preferred in some localities. In other respects they are just like our other Cistern Pumps.

Fitted for lead or wrought-iron pipe, or both, as ordered.

FIG. 210. Sizes, Prices, Etc.

No.	Dia. Cyl.	Suction.	Capacity per Stroke.	Weight.	IRON.		BRASS CYLINDER.		BRASS.	
					Cipher.	Price.	Cipher.	Price.	Cipher.	Price.
1	2¼ in.	1¼ in.	1-10 gal.	35 lbs.	Scof	$5.00	Virtual	$7.00	Viscid	$9.75
2	2½ "	1¼ "	1-8 "	37 "	Scoff	5.50	Virtue	8.00	Viscount	11.50
4	3 "	1¼ "	1-6 "	44 "	Scoop	6.50	Virulent	11.00	Vise	18.00
6	3½ "	1½ "	1-4 "	52 "	Scope	9.00	Virus	19.00	Vishnu	28.00
8	4 "	2 "	1-3 "	61 "	Score	10.50	Visage	26.00	Visible	36.00

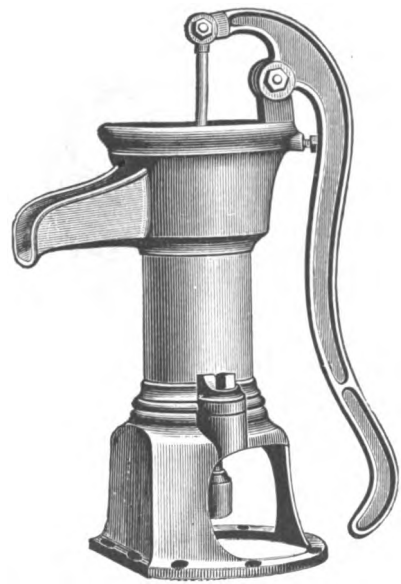
Brass lower valves and metal packing to adapt Cistern Pumps for hot water extra, as below:

No. 0, each, net,	$1.25	No. 5, each, net,	$2.00
No. 1, " "	1.25	No. 6, " "	2.25
No. 2, " "	1.50	No. 7, " "	2.50
No. 3, " "	1.65	No. 8, " "	2.50
No. 4. " "	1.75		

OPEN TOP PITCHER SPOUT PUMP.

WITH REVOLVING BRAKE, BOLT FASTENINGS AND CUT-OFF BASE.

FIG. 205.



The cut shown on this page is our new style Pitcher Spout Pump. They are fitted up in the very best manner, and all made with the revolving standard or bearer, which, by loosening the set screw, allows the lever to be moved to any position desired. They are all made so that by raising the lever the valves are tripped and the water all let out of the Pump. In this, as in all other Pumps of our make, the cylinders are all bored, and not ground on the surface of a rough casting. This insures a perfect cylindrical form, and a perfect working Pump.

These Pumps are arranged to be used for either lead or wrought-iron pipe, by a coupling nut fastened to the hub under the base, through which a brass soldering tube is introduced. Inside the nut are gas-pipe threads into which iron pipe can be screwed when this connection is desired. We also make these Pumps with brass valve seats — brass tube having a thread cut on it to take a gas-pipe coupling or an iron nut with brass soldering tube.

We can put our Patent Sand Valve Bases on these Pumps when so ordered.

FIG. 205. Sizes, Prices, Etc.

No.	Diameter Cyl.	Suction Pipe	Capacity per Stroke.	Weight.	Cipher.	Price.
1	2½ in.	1 in.	1-12 gal.	25 lbs.	Bale	$4.25
2	3 in.	1¼ in.	1-8 "	28 "	Balk	4.75
3	3½ in.	1¼ in.	1-6 "	31 "	Ball	5.25
4	4 in.	1½ in.	1-5 "	36 "	Balm	5.75
5	4½ in.	1½ in.	3-10 "	40 "	Band	6.25

CLOSE TOP PITCHER SPOUT PUMP.

WITH REVOLVING BRAKE, BOLT FASTENINGS AND CUT-OFF BASE.

FIG. 205 1-2.

The above is an illustration of our Pitcher Spout Pump, with a *closed top*. It is often a cause of complaint with the Open Top Pitcher Pumps that they are apt to throw the water over the top when worked rather sharply. To obviate this, we have introduced a closed top with an opening only large enough for the rod to work through. In all other respects this Pump is the same as our other Pitcher Pumps. For a full description would refer to Fig. 205, on opposite page. Please advise in your orders whether wanted for wrought-iron or lead-pipe connections.

We can put our Patent Sand Valve Bases on these Pumps when so ordered.

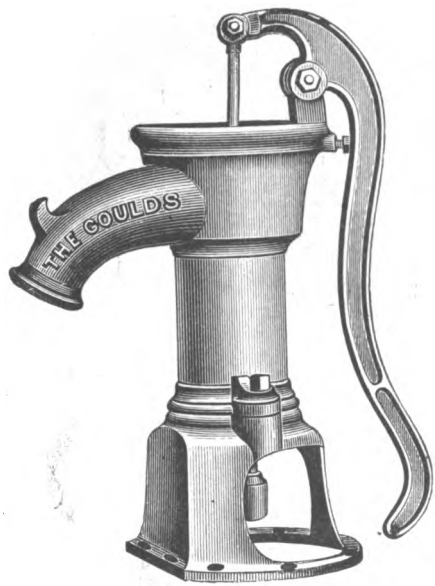
FIG. 205 1-2. Sizes, Prices, Etc.

No.	Diameter Cyl.	Suction Pipe.	Capacity per Stroke.	Weight.	Cipher.	Price.
1	2½ in.	1 in.	1-12 gal.	26 lbs.	Bank	$4.25
2	3 "	1¼ "	1-8 "	29 "	Barb	4.75
3	3½ "	1¼ "	1-6 "	33 "	Bark	5.25
4	4 "	1½ "	1-5 "	38 "	Barn	5.75

CLOSE SPOUT PITCHER PUMP.

WITH REVOLVING BRAKE, BOLT FASTENINGS AND CUT-OFF BASE.

FIG. 209.



The above shows our new style Pitcher Pump with a close spout. Thus constructed the water is confined in the spout and cannot wash over. There is also a convenient place on the spout for hanging a pail or bucket.

These are made like our other Pitcher Pumps, with revolving brake, bolt fastenings and cut-off base.

These Pumps we make with both open and close tops, as ordered, and we can also make them with our patent vacuum base at a slight increase in expense. Please state in your order whether you wish them fitted for lead or wrought-iron pipe connections, as we make them both ways, also whether with open or close tops. At present we make only the No. 2 size, but we can make other sizes in a very short time should there be a demand for them.

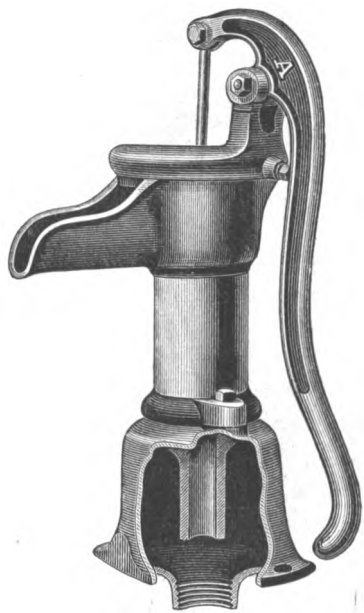
FIG. 209. Size, Price, Etc.

No.	Diameter Cyl.	Suction Pipe.	Capacity per Stroke.	Weight.	Cipher.	Price.
2	3 in.	1¼ in.	1-8 gal.	31 lbs.	Bleat	$4.75

PATENT PITCHER SPOUT PUMP.

WITH VACUUM BASE.

FIG. 208.



The Pump above represented is the same as our Fig. 205, with revolving brake, bolt fastenings and cut-off base, and, in addition, it has an improvement in the base of the Pump, which in many localities will be greatly appreciated. Oftentimes in driven wells, where the soil is so tight as to make an air-tight joint around the pipe when driven in the ground, and the supply of water is also limited, an ordinary Pump will not work well, while with the Vacuum Base Pump all difficulty is obviated, for by creating a vacuum in the base and permitting the water to form there a reservoir, is obtained therefrom a constant supply of water to the Pump. For roilly or gritty water these Pumps are also well adapted. We fit them always for wrought-iron pipe, with the thread cut in the hub of the base, as shown in the cut.

Please state in your orders whether you wish them with open or close tops, for we make them both ways.

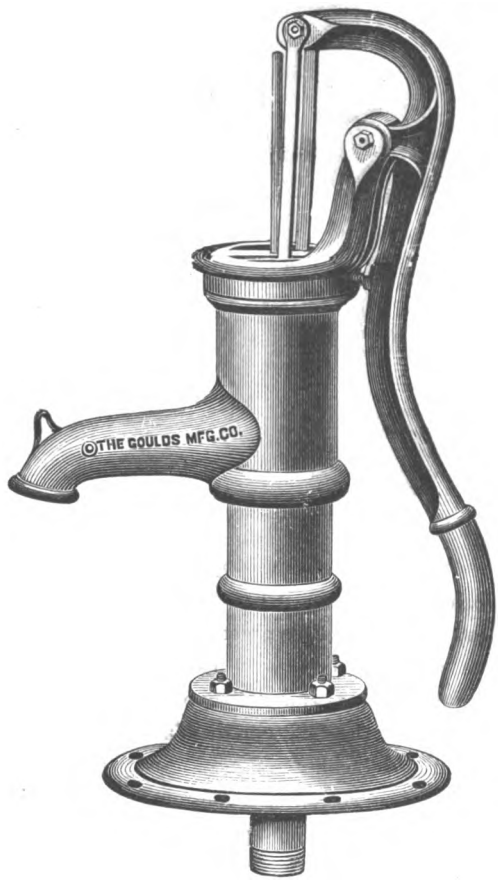
FIG. 208. Sizes, Prices, Etc.

No.	Diameter Cyl.	Suction Pipe.	Capacity per Stroke.	Weight.	Cipher.	Price.
1	2½ in.	1 in.	1-12 gal.	31 lbs.	Bird	$4.75
2	3 "	1¼ "	1-8 "	34 "	Bite	5.25
3	3½ "	1¼ "	1-6 "	40 "	Blast	5.75

MOLASSES, OR HOT-LIQUID PUMP.

METALLIC FITTED.

FIG. 444.



The cut represents our Fig. 444, built for pumping molasses, syrups of any kind, tar, oil, or any other liquids of any consistency, either hot or cold. The piston, piston rod, valves and connecting tube of the iron Pumps are made of brass, while the balance is constructed of iron. The lever can be shifted to suit any peculiarity of situation and is heavy enough to do any ordinary work. When ordered of brass, the whole Pump is made of that metal except the base, top and lever, and is so constructed that no iron is brought in connection with the medium.

When used for hot liquid we would urge placing the Pump as close to it as possible, as the vapors arising from it will qualify the vacuum produced by the Pump.

We make five sizes, as follows, fitted for lead or wrought-iron pipe connections:

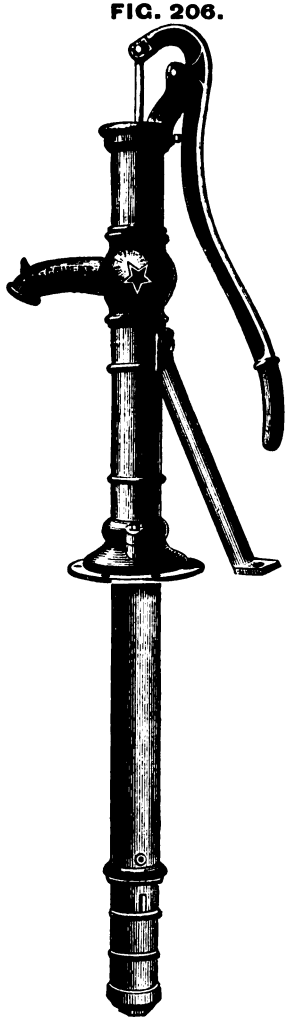
FIG. 444. Sizes, Prices, Etc.

No.	Diam. Cyl.	Suction Pipe.	Capacity per Stroke.	Weight.	IRON.		BRASS.	
					Cipher.	Price.	Cipher.	Price.
2	2½ in.	1¼ in.	1 8 gal.	40 lbs.	Folly	$12.00	Force	$20.00
4	3 "	1½ "	1-6 "	44 "	Fond	15.00	Ford	25.00
6	3½ "	1½ "	1-4 "	45 "	Font	17 00	Fore	30.00
8	4 "	2 "	1-3 "	47 "	Food	21.00	Forge	36.00
10	4½ "	2½ "	2-5 "	50 "	Fop	25.00	Fork	42.00

STAR WELL PUMP. ANTI-FREEZING.

WITH CAST-IRON CONNECTING PIPE. PATENT SAND VALVE.

FIG. 206.



The cut represents our Fig. 206, a well-formed and attractive Pump, as the cut indicates. It is adapted for setting in out-door cisterns and shallow wells, where water is not to be lifted over 15 to 25 feet. It is composed of a standard, cast-iron connecting pipe and cylinder, having the valves in it. The iron pipe connecting the standard and cylinder together is about three feet long, and is screwed into the base of the Pump, and the cylinder in turn is screwed into the connecting pipe, making the valves sufficiently far below the base or platform to be unaffected by the action of frost, while the water that remains in the Pump and connecting pipe after pumping runs out through an orifice just over the cylinder. These provisions make these Pumps perfectly anti-freezing, and are therefore very desirable in exposed locations.

The internal diameter of the standard is a trifle larger than that of the cylinder; hence the plunger, after removing the top, which can be done by loosening the set screw under the lever, can be drawn up through it, repaired and replaced with very little effort or delay. These Pumps all have our patent sand-valve attachment, which has been the means of making it possible to use Pumps in some kinds of soil where hitherto it has been impossible to do so. These Pumps are much used in connection with driven wells also.

FIG. 206. Sizes, Prices, Etc.

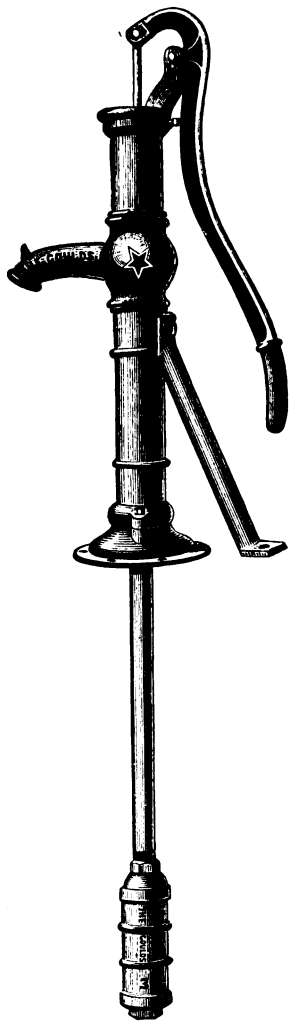
No.	Diameter Cylinder.	Suction.	Stroke.	Capacity per Stroke.	Height, Base to Lever Top	Base to Lower Valve.	Cipher.	Price.
2	2¼ in.	1 in.	6 in.	1-10 gal.	33 in.	36 in.	Bath	$7.00
3	2½ "	1¼ "	6 "	1-8 "	35 "	36 "	Beam	7.50
4	2¾ "	1¼ "	6 "	1-7 "	38 "	36 "	Bean	8.00
5	3 "	1¼ "	6 "	1-6 "	40 "	36 "	Bear	8.50

	No. 2.	No. 3.	No. 4.	No. 5.
Standard complete, less set length, ...	$4.25	$4.50	$5.00	$5.25

STAR WELL PUMP. ANTI-FREEZING.

WITH WROUGHT-IRON CONNECTING PIPE. PATENT SAND VALVE.

FIG. 207.



The cut represents our Fig. 207, which is very similar in design to the Pump on previous page. The connecting pipe is, however, of wrought instead of cast iron, and is three feet in length. This Pump is equally appropriate for out-door cisterns and shallow wells, and is also anti-freezing by the nature of its construction. The base and standard are bolted together by two strong bolts, and the whole combination of the different parts is such as to produce a strong yet simple Pump, not liable to get out of repair, and very efficient. By adding to the connecting pipe and piston rod, and dropping the cylinder further into the well, until the cylinder is within, say, 15 to 20 feet of the surface of the water, this Pump could be used in wells from 30 to 40 feet deep. The connection and suction pipe in case of considerable length, should be properly braced from the sides of the well to prevent them from swaying.

This Pump is a favorite with drive-well men, and is largely patronized by them. Our inimitable patent sand-valve seat is always attached to this as well as many other Pumps of this class, and makes its use feasible in any kind of soil. We make the lower valve either of leather alone or with rubber-facing on the leather, *as ordered.* We can furnish Standard and Cylinder only, when desired, where buyers wish to furnish the connecting pipe themselves. We make five sizes, as follows:

FIG. 207. Sizes, Prices, Etc.

No.	Diam. Cyl.	Suction.	Stroke.	Capacity per Stroke.	Height Base to Lever Top.	Base to Lower Valve.	Cipher.	Price.
1	2¼ in.	1 in.	6 in.	1-10 gal.	33½ in.	48 in.	Bell	$7.00
2	2½ "	1¼ "	6 "	1-8 "	35½ "	48 "	Belt	7.50
3	2¾ "	1¼ "	6 "	1-7 "	38½ "	48 "	Bend	8.00
4	3 "	1¼ "	6 "	1-6 "	40½ "	48 "	Bent	8.50
5	3¼ "	1¼ "	6 "	1-5 "	40½ "	48 "	Best	9.00

	No. 1.	No. 2.	No. 3.	No. 4.	No. 5.
Standard complete, less set length, . . .	$3.75	$4.25	$4.50	$5.00	$5.25

NEW STAR, "1885," WELL PUMP. ANTI-FREEZING.

WROUGHT-IRON CONNECTING PIPE. PATENT SAND VALVE.

FIG. 550.

This, our latest and best of its kind, is called our New Star, "1885," Well Pump. The suspended working cylinder implies that it is anti-freezing.

This is the smallest of a line of three Pump Standards, each of which is illustrated, described, and their respective dimensions given on this and the two following pages. The general outline is similar to Fig. 207, although the bearer top is of new and improved design.

When built as described it is intended for outdoor cisterns and shallow wells — dug, drilled, or driven — where water is not more than 25 feet below ground line.

In our opinion, this Pump, as shown by the three illustrations, is so superior and desirable in every respect, and so fully supplies the average demand for a Pump of its kind, that we shall aim to have it supplant all other styles of set length well Pumps we now manufacture.

Our Wind Mill Tops, as shown under Figs. 553, 554, and 555, will interchange with these bearer tops size for size.

The height of Standard from base to lever top is 43 inches.

FIG. 550. Sizes, Prices, Etc.

No.	Diam. Cyl.	Suction.	Stroke.	Capacity per Stroke.	Cipher.	Price.
2	2½ in.	1¼ in.	6 in.	1-8 gal.	Varvels	$8.00
3	2¾ "	1¼ "	6 "	1-7 "	Vase	8.25
4	3 "	1¼ "	6 "	1-6 "	Vassal	8.50
5	3¼ "	1¼ "	6 "	1-5 "	Vast	8.75

Standard complete, less set length, $5.50.

Always tapped for above size pipe unless expressly ordered otherwise.

All parts interchangeable.

NEW STAR, "1885," WELL PUMP. ANTI-FREEZING.

WROUGHT-IRON CONNECTING PIPE. PATENT SAND VALVE.

FIG. 551.

This Pump Standard is about two inches taller than Fig. 550 and proportionately heavier and can be used for same purposes.

The general description of Pump on previous page applies to this, and we know our friends can commend it as the best Pump of its style ever offered to the trade.

The subjoined table gives all needed information about prices, sizes, etc.

The height of Standard from base to lever top is 45 inches.

FIG. 551. Sizes, Prices, Etc.

No.	Diam. Cyl.	Suction.	Stroke.	Capacity per Stroke.	Cipher.	Price.
3	2¾ in.	1¼ in.	6 in.	1-7 gal.	Vastly	$8.75
4	3 "	1¼ "	6 "	1-6 "	Vasty	9.00
5	3¼ "	1¼ "	6 "	1-5 "	Vat	9.25

Standard complete, less set length, $6.00.

Always tapped for above size of pipe unless ordered otherwise.

All parts interchangeable.

NEW STAR, "1885," WELL PUMP. ANTI-FREEZING.

WROUGHT-IRON CONNECTING PIPE. PATENT SAND VALVE.

FIG. 552.

This is the largest of our three new Pump Standards mentioned under Fig. 550, to which we refer, being about 4 inches taller than that one, and can, therefore, be used where it would not be advisable to place either of the others.

For public places, where it would have indiscriminate and not always the most careful use, it would be well adapted, as it is strong and well proportioned.

We would not hesitate to recommend this for wells up to 50 feet deep, in which case a Standard, without set length, but with suitable cylinder, would be required.

We have numerous customers making a business of putting down wells, to whom we supply Pumps, with pipe, connecting rods, couplings, etc., for wells of any stated depth, and the expense to them is less than if they cut the pipe, rods, etc., themselves. For the general run of well jobs this Standard would be fully competent.

The height of Standard from base to lower valve is 47 inches.

FIG. 552. Sizes, Prices, Etc.

No.	Diam. Cyl.	Suction.	Stroke.	Capacity per Stroke.	Cipher.	Price.
3	2¾ in.	1¼ in.	6 in.	1-7 gal.	Vatican	$9.25
4	3 "	1¼ "	6 "	1-6 "	Vault	9.50
5	3¼ "	1¼ "	6 "	1-5 "	Vaulted	9.75
6	3½ "	1½ "	6 "	1-4 "	Vaulting	10.25
7	3¾ "	1½ "	6 "	1-3 "	Vaunt	11.00

Standard complete, less set length, $6.50.

Always tapped for above sizes of pipe, but can vary when so directed.

All parts interchangeable.

NEW STAR, "1885," WELL PUMP. WIND MILL TOP.

WROUGHT-IRON CONNECTING PIPE. ANTI-FREEZING. PATENT SAND VALVE.

FIG. 553.

The cut shows our New Star, "1885," Well Pump, with Wind Mill Top, and set length to prevent freezing. This style of Pump is liked, because the piston rod is guided above and moves up and down in a straight line, instead of oscillating, and because there is no opening through which anything can be thrown into the well.

We make three sizes of Standards, as shown on this and the two succeeding pages, with different sizes of working cylinders as wanted, full details of which, with prices, etc., will be found in the proper tables.

The general construction of this Pump Standard is more fully described under Fig. 762; while its adaptations are set forth under Fig. 550, to which we refer.

The height of Standard from base to upper guide is 43 inches.

FIG. 553. Sizes, Prices, Etc.

No.	Diam. Cyl.	Suction.	Stroke.	Capacity per Stroke.	Cipher.	Price.
2	2½ in.	1¼ in.	6 in.	1-8 gal.	Veck	$9.00
3	2¾ "	1¼ "	6 "	1-7 "	Vection	9.25
4	3 "	1¼ "	6 "	1-6 "	Vector	9.50
5	3¼ "	1¼ "	6 "	1-5 "	Vecture	9.75

We do not send Wind Mill Slides with these Pumps unless especially ordered.

All parts interchangeable.

NEW STAR, "1885," WELL PUMP. WIND MILL TOP.

WROUGHT-IRON CONNECTING PIPE. ANTI-FREEZING. PATENT SAND VALVE.

FIG. 554.

This represents the middle size of our New Star Standard, which can be studied under Figs. 762 and 550 for method of construction, adaptation, etc., etc.

We feel justly proud of this entire line of Pumps and shall be much surprised if our friends have anything but good words to say of them. We have nothing better to show, at least, and we think an experience of about 35 years ought to give weight to our assurances.

The height of Standard from base to lower guide is 45 inches.

FIG. 554. Sizes, Prices, Etc.

No.	Diam. Cyl.	Suction.	Stroke.	Capacity per Stroke.	Cipher.	Price.
3	2¾ in.	1¼ in.	6 in.	1-7 gal.	Veda	$ 9.75
4	3 "	1¼ "	6 "	1-6 "	Vedet	10.00
5	3¼ "	1¼ "	6 "	1-5 "	Veer	10.25

We do not send Wind Mill Slides unless especially ordered. All parts interchangeable.

NEW STAR, "1885," WELL PUMP. WIND MILL TOP.

WROUGHT-IRON CONNECTING PIPE. ANTI-FREEZING. PATENT SAND VALVE.

FIG. 555.

This is the largest of the new style "Stars," and we, therefore, build them with a greater range of working cylinders than the others. An examination of its dimensions will show that it is quite pretentious, and we know there is no more Pump for the money made by any manufacturer.

A glance at Fig. 762, perhaps, would give some additional information about it; but as this whole line of Pump Standards has yet to be seen by the trade, we can only assert that there is nothing in the field that can approach any of them in respect to their fine general appearance, splendid proportions, and excellent finish.

The height of Standard from base to upper guide is 47 inches.

FIG. 555. Sizes, Prices, Etc.

No.	Diam. Cyl.	Suction.	Stroke.	Capacity per Stroke.	Cipher.	Price.
3	2¾ in.	1¼ in.	6 in.	1-7 gal.	Veering	$10.25
4	3 "	1¼ "	6 "	1-6 "	Vegetal	10.50
5	3¼ "	1¼ "	6 "	1-5 "	Vegete	10.75
6	3½ "	1½ "	6 "	1-4 "	Vegetive	11.25
7	3¾ "	1½ "	6 "	1-3 "	Vegetous	12.00

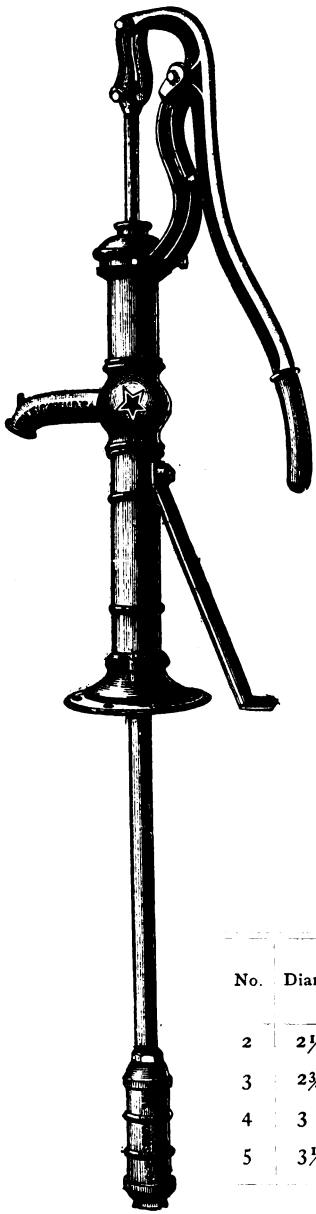
We do not send Wind Mill Slides with these Pumps unless especially ordered.

All parts interchangeable.

STAR WELL PUMP. TIGHT TOP, ANTI-FREEZING.

WITH WROUGHT-IRON CONNECTING PIPE. PATENT SAND VALVE.

FIG. 234.



The cut represents our Fig. 234, made exactly like Fig. 207, with the exception of the tight top and its necessary appliances. The same size of this Pump is, from its construction, considerably taller than a corresponding size of the open top, and cannot be impaired by having stones and dirt thrown into it, on account of its close top. It has found many admirers on this account, and it seems to be well regarded by the trade.

It is anti-freezing also, and has our patent sand-valve seat on the cylinder. The connecting pipe is wrought iron; the rod is polished, and the bearer and lever can be revolved to any desired position. It will be seen this Pump possesses all the characteristics that are of importance and value, and is all that can be sought for in one of its kind, while its cheapness, considering its large size, is certainly much in its favor.

We make four sizes.

FIG. 234. Sizes, Prices, Etc.

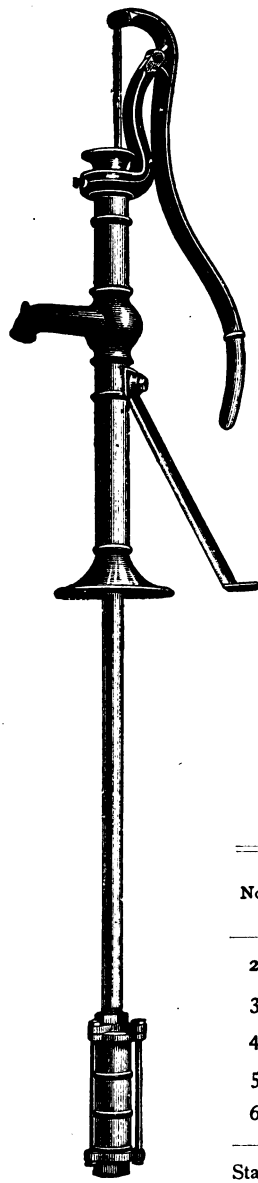
No.	Diam. Cyl.	Suction.	Stroke.	Capacity per Stroke.	Cipher.	Price.
2	2½ in.	1¼ in.	6 in.	1-8 gal.	Cadet	$8.25
3	2¾ "	1¼ "	6 "	1-7 "	Cage	8.75
4	3 "	1¼ "	6 "	1-6 "	Cake	9.25
5	3¼ "	1¼ "	6 '	1-5 "	Call	9.75

	No. 2.	No. 3.	No. 4.	No. 5.
Standard complete, less set length, ...	$5.00	$5.25	$5.75	$6.00

NEW DRIVE WELL PUMP. ANTI-FREEZING.

WITH WROUGHT-IRON CONNECTING PIPE. PATENT SAND VALVE.

FIG. 517.



The cut shows a new Pump we have just designed, especially for the renowned Driven Wells. While we have been for years making Pumps applicable to this purpose, this differs from the others in being considerably taller, having a funnel-shaped top cap, for convenience of introducing water into the Pump through the top when necessary, and, being small in internal diameter, makes only a small reservoir to fill before the water passes out through the spout.

The cut shows the Pump with bolted cylinder, though we construct them with screw attachments as well. These Pumps are anti-freezing, and all have our patent Sand Valve attached to them.

These Pumps can be used on wells 25 to 30 feet deep, and by lengthening out the gas pipe and rods, and placing the cylinder, say, within 15 to 20 feet of the water, are often used in wells 50 to 60 feet deep.

All our threads are cut to exact gauges, so that all our repairs fit.

The height of Standard from base to lever top is 48 inches.

FIG. 517. Sizes, Prices, Etc.

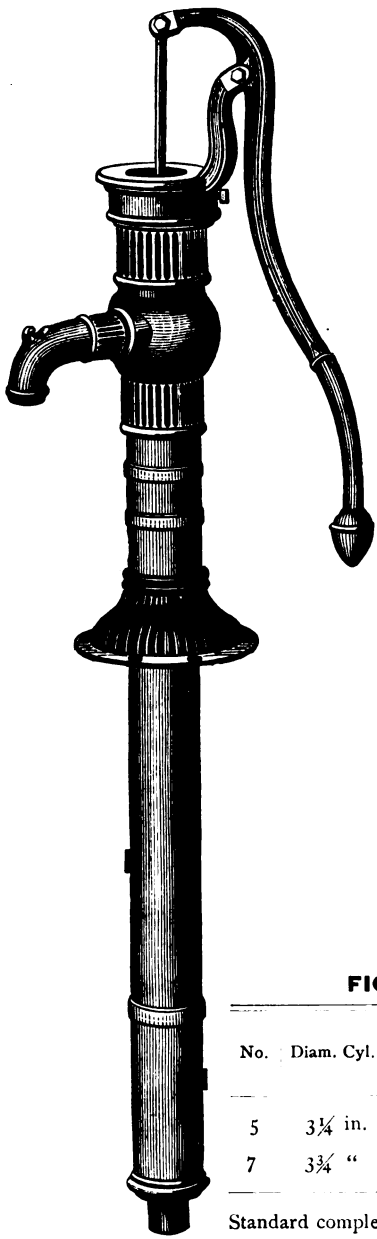
No.	Diam. Cyl.	Suction.	Stroke.	Capacity per Stroke.	Cipher.	Price.
2	2½ in.	1¼ in.	6 in.	1-8 gal.	Hip	$8.25
3	2¾ "	1¼ "	6 "	1-7 "	Hire	8.50
4	3 "	1¼ "	6 "	1-6 "	Hiss	8.75
5	3¼ "	1¼ "	6 "	1-5 "	Hist	9.00
6	3½ "	1½ "	6 "	1-4 "	Hive	9.25

Standard complete, less set length, ... $5.50

PATENT IMPROVED WELL PUMP. ANTI-FREEZING.

WITH CAST OR WROUGHT-IRON CONNECTING PIPE.

FIG. 227.



The cut, Fig. 227, shows an open-top Well Pump, for wells from 15 to 25 feet deep. It is very strong and durable, of handsome design, and calculated to give good satisfaction. It is also rendered anti-freezing by placing the valves out of reach of frost. With adjustable fulcrum, or bearer, heavy ball lever and perfectly round and well finished cylinder, it is the equal of any Pump made. The piston can also be drawn out through the top.

When desired we can furnish Standards and Cylinders only, the base and top attachment of cylinder being tapped to connect the two by gas pipe. The cylinder then can be placed as far down into the well as fancy or circumstances may suggest, but it must be placed within 10 or 15 feet of the water.

When so ordered we can fit up these Pumps with wrought-iron connecting pipe, at same list price.

Height of Standard from base to lever top, No. 5, 40 in.; No. 7, 45 in.

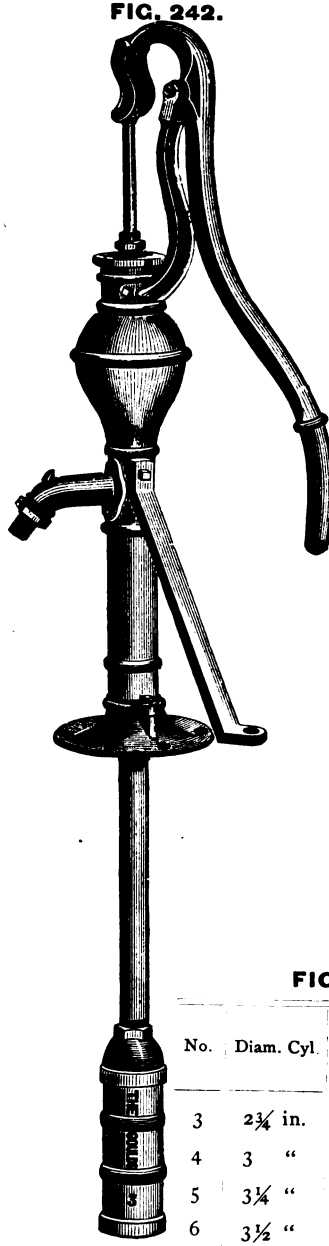
FIG. 227. Sizes, Prices, Etc.

No.	Diam. Cyl.	Suction.	Stroke.	Capacity per Stroke.	Cipher.	Price.
5	3¼ in.	1½ in.	6 in.	1-5 gal.	Brow	$12.00
7	3¾ "	1½ "	6 "	3-10 "	Brush	13.00
					No. 8.	No. 9.
Standard complete, less set length, ...					$8.00	$8.50

TUBE WELL FORCE PUMP. ANTI-FREEZING.

WITH WROUGHT-IRON CONNECTING PIPE AND PATENT SAND VALVE.

FIG. 242.



The cut, Fig. 242, represents our new Tube Well Force Pump, constructed with special reference to the requirements of the Driven Well. The want of such a Pump, at once tall, strong, graceful, serviceable and *cheap*, has long been felt; and in offering this to the trade and public, we only supply a universal demand. The standard is four feet four inches high, and is strengthened by a supporting brace under the lever, which is made heavy and long. The piston rod passes through a brass stuffing box on top of the air chamber, which surmounts the stock of the Pump. By this arrangement the danger of the rod becoming coated with ice near the stuffing box in severe weather is reduced to a minimum, while the addition to the height of the Pump lessens considerably the labor of working it. By means of a coupling, furnished gratuitously, hose is readily attached to the spout. The cylinder of the Pump is three feet below the platform, at which point a small vent hole allows the water in the stock and connecting pipe to escape each time after pumping, thus preventing any danger from freezing.

These Pumps can be used on wells from 25 to 30 feet deep, and by lengthening out the gas pipe and rods and lowering the cylinder to within 20 or 25 feet of the water, are often used on wells 50 to 60 feet deep.

The thumb screw in air chamber should be tight when used in forcing water. Loosen it when used for common well purposes.

The height of Standard from base to lever top is 52 inches.

FIG. 242. Sizes, Prices, Etc.

No.	Diam. Cyl.	Suction.	Stroke.	Capacity per Stroke.	Cipher.	Price.
3	2¾ in.	1¼ in.	6 in.	1-7 gal.	Cast	$13.00
4	3 "	1¼ "	6 "	1-6 "	Catch	13.00
5	3¼ "	1¼ "	6 "	1-5 "	Cause	13.50
6	3½ "	1½ "	6 "	1-4 "	Cave	14.50

Standard complete, less set length, ... $10.00

"NORTHERN" STAR FORCE PUMP.

WITH THREE FEET WROUGHT-IRON CONNECTING PIPE. PATENT SAND VALVE.

FIG. 699.

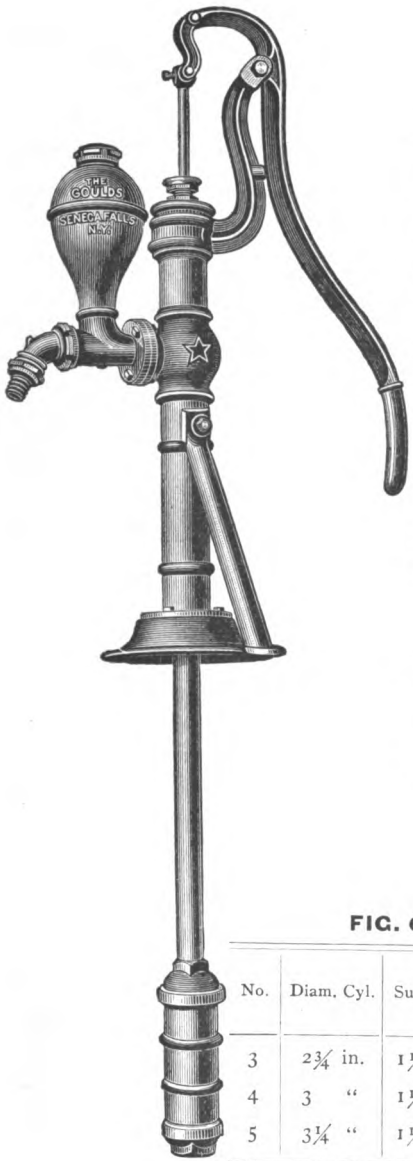


Fig. 699 is a Force Pump, somewhat lighter than our Fig. 242 Force Pump, and made with the standard fastened to the base with four bolts, making it very rigid and firm. It is a very neat and pretty Pump in appearance, and for wells from 20 to 40 feet deep will render efficient service.

Loosen the nut on top of the air chamber when used for ordinary pumping, and tighten it when used for forcing purposes.

The height of Standard from base to lever top is 43½ inches

We can also furnish this Pump with a cock in the spout at $2.50 extra list.

FIG. 699. Sizes, Prices, Etc.

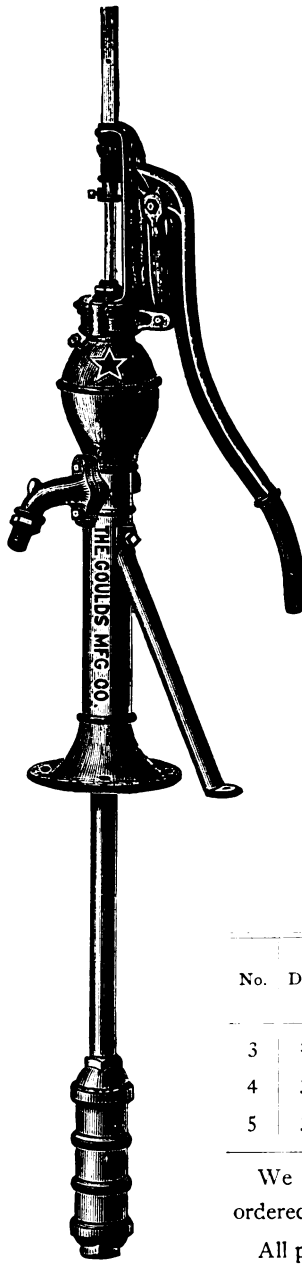
No.	Diam. Cyl.	Suction.	Stroke.	Capacity per Stroke.	Cipher.	Price.
3	2¾ in.	1¼ in.	6 in.	1-7 gal.	Flake	$13.50
4	3 "	1¼ "	6 "	1-6 "	Flam	14.00
5	3¼ "	1¼ "	6 "	1-5 "	Flame	14.50

Standard complete, less set length, ... $11.00

NEW STAR, "1885," FORCE PUMP. WIND MILL TOP.

WROUGHT-IRON CONNECTING PIPE. PATENT SAND VALVE.

FIG. 424.



The cut shows our New Star Force Pump Standard (Fig. 422, No. 1), when arranged with cylinder below and wrought-iron connecting pipe.

Our method of fastening the top to the body is peculiar but most effective. Two strong hook bolts pass down through the top and catch into a groove made in the body to receive them, holding the two unyieldingly together by screwing down the nuts; while by releasing the pressure on the hooks, by unscrewing the nuts, the top can be revolved to any desired position.

When stuffing box is in the body instead of the top, as ours is, there must be more or less friction, as the bearings are not in line from their very manner of construction, and cannot be made so without great trouble.

We can recommend it to take the places of Figs. 242 and 699, without prejudice to the purchaser.

The height of Standard from base to upper guide is 47 inches.

FIG. 424. Sizes, Prices, Etc.

No.	Diam. Cyl.	Suction.	Stroke.	Capacity per Stroke.	Cipher.	Price.
3	2¾ in.	1¼ in.	6 in.	1-7 gal.	Vell	$13.25
4	3 "	1¼ "	6 "	1-6 "	Vellet	13.50
5	3¼ "	1¼ "	6 "	1-5 "	Vellum	14 00

We do not send Wind Mill Slides unless especially ordered.

All parts are interchangeable.

NEW STAR, "1885," FORCE PUMP. WIND MILL TOP.

WROUGHT-IRON CONNECTING PIPE. PATENT SAND VALVE.

FIG. 425.

The cut shows our New Star Force Pump Standard (No. 2, Fig. 422,) when arranged with cylinder below and wrought-iron connecting pipe.

Our remarks on Fig. 424, on the opposite page, will apply to this Pump in every particular, as it differs from that only in being three inches taller and proportionately heavier and stronger. Each one has an outlet back of the spout for attaching pipe, and the spout is provided with hose tube for hose.

Every part is strong and equal to any demand that may be made upon it; while it is put together in an unsurpassed manner, as are all our Pumps.

The height of Standard from base to upper guide is 50 inches.

FIG. 425. Sizes, Prices, Etc.

No.	Diam. Cyl.	Suction.	Stroke.	Capacity per Stroke.	Cipher.	Price.
3	2¾ in.	1¼ in.	6 in.	1-7 gal.	Velocity	$14.25
4	3 "	1¼ "	6 "	1-6 "	Velure	14.50
5	3¼ "	1¼ "	6 "	1-5 "	Velvet	15.00
6	3½ "	1½ "	6 "	1-4 "	Velvety	16.00

We do not send Wind Mill Slides unless especially ordered.

All parts are interchangeable.

NEW STAR, "1885," FORCE PUMP. WIND MILL TOP.

WROUGHT-IRON CONNECTING PIPE AND PATENT SAND VALVE, WITH COCK.

FIG. 426.

This Pump is the same in all respects as Fig. 424 described on page 34, with the addition of a cock on the spout.

When pipe is connected to side opening behind the spout there must be some means for closing the spout opening, and a cock does this. The nose of cock is screwed for 1¼ inch gas pipe thread and will take hose coupling of proper size.

We build three sizes and always fit as below unless especially ordered otherwise.

The height of Standard from base to upper guide is 47 inches.

We can also fit our Fig. 425, shown on previous page, with a cock spout, at $2.50 extra list.

FIG. 426. Sizes, Prices, Etc.

No.	Diam. Cyl.	Suction.	Stroke.	Capacity per Stroke.	Cipher.	Price.
3	2¾ in.	1¼ in.	6 in.	1-7 gal.	Vogle	$15.75
4	3 "	1¼ "	6 "	1-6 "	Voglite	16.00
5	3¼ "	1¼ "	6 "	1-5 "	Vogue	16.50

We do not send Wind Mill Slides unless especially ordered.

All parts are interchangeable.

"SOUTHERN" STAR WELL AND FORCE PUMPS.

FOR OUT-DOOR USE IN WARM CLIMATES.

FIG. 607.

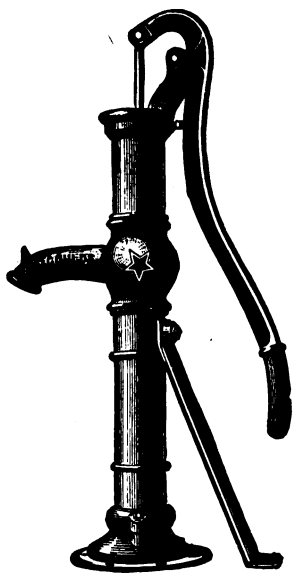
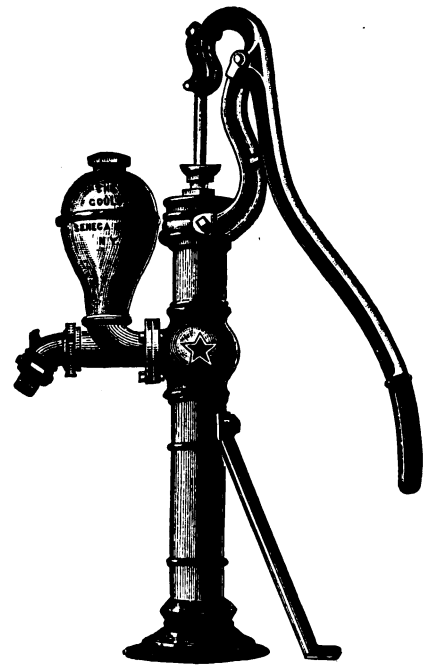


FIG. 608.



We have often had calls for Suction and Lifting Pumps taller than our largest sizes of Cistern Pumps, and we offer Fig. 607 to meet this demand.

When a Suction and Force Pump is wanted taller than our Hand Force Pumps, as shown by Fig. 394, etc., we offer Fig. 608. Both these Pumps can be emptied of the water by lifting up the lever to its extreme height.

A thread is cut on the end of the spout of Fig. 608, and with this Pump is sent a half hose coupling and tube for attaching one inch hose.

FIG. 607. Sizes, Prices, Etc.

No.	Diam. Cyl'd'r.	Suction.	Stroke.	Capacity per Stroke.	Height.	Weight.	Cipher.	Price.
4	3 in.	1¼ in.	6 in.	1-6 gal.	40½ in.	56 lbs.	More	$8.50
5	3¼ "	1½ "	6 "	1-5 "	40½ "	58 "	Morn	9.00

FIG. 608. Sizes, Prices, Etc.

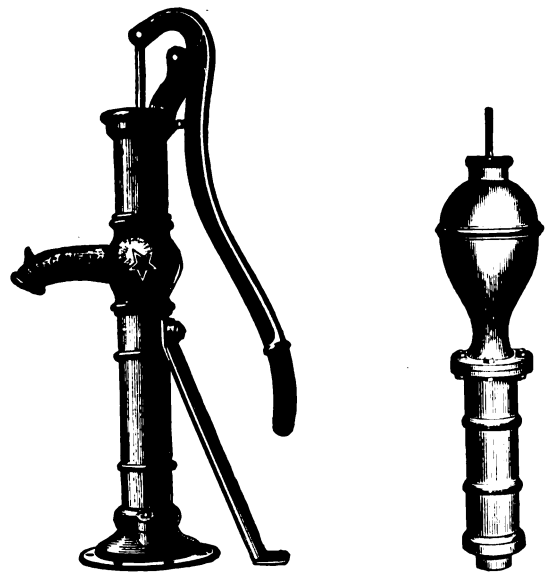
No.	Diam. Cyl'd'r.	Suction.	Stroke.	Capacity per Stroke.	Height	Weight.	Cipher.	Price.
4	3 in.	1¼ in.	6 in.	1-6 gal.	48 in.	98 lbs.	Mort	$13.00
5	3¼ "	1½ "	6 "	1-5 "	50 "	113 "	Moss	14.00
6	3½ "	1½ "	6 "	1-4 "	50 "	118 "	Most	15.00

When ordered with cock spout we add $2.50 to list price of Fig. 608.

STANDARD AND CYLINDER.

FOR DEEP WELLS.

FIG. 559.



Under style of Fig. 559, we arrange our lift Standard, described on the previous page, with our deep well Cylinder, surmounted with an air chamber. The effect of this air chamber above the Cylinder, is to relieve it, and the entire connecting pipe and Standard, of the usual jerk and strain common in pumping water from deep wells, and at the same time supplying a constant and steady stream at the discharge. When desired, we can fit up this Standard and Cylinder with the necessary connecting pipe and rods for wells of any depth, or the table given below will give parties the needed information to do so themselves.

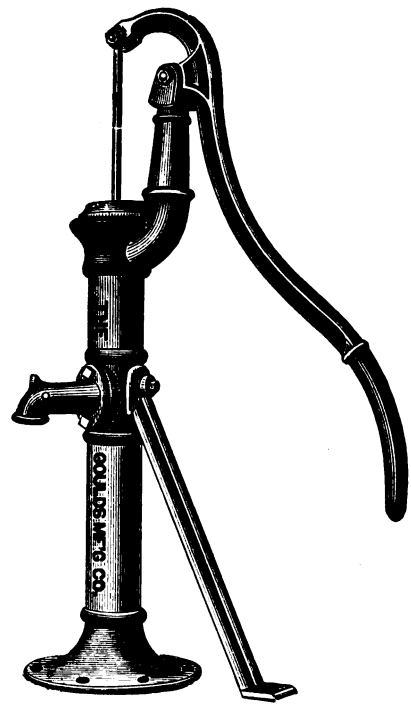
FIG. 559. Sizes, Prices, Etc.

No.	Diam. Cyl.	Suction.	Stroke.	Capacity per Stroke.	Length of Cylinder.	Height of Standard.	Weight.	Cipher.	Price.
4	3 in.	1¼ in.	6 in.	1-6 gal.	12 in.	40½ in.	84 lbs.	Lava	$12.00
8	4 "	1½ "	6 "	1-5 "	12 "	40½ "	86 "	Law	18.00

NEW WELL PUMP STANDARD.

SCREWED FOR IRON PIPE.

FIG. 486.



Above cut represents our New Well Pump Standard, for shallow wells. While hardly as heavy in casting as our figure 236, described on page 42, it is strong and well made and presents a graceful appearance. The very strong bearer top and long and heavy lever will adapt this Standard for wells of more than ordinary depth, and it is sometimes used over very deep wells. The Standard is tapped for wrought-iron pipe near the spout.

FIG. 486. Size, Price, Etc.

	Suction.	Stroke.	Height.	Weight.	Cipher.	Price.
Standard complete	1¼ in.	8 in.	43½ in.	58 lbs.	Harm	$6.00

We can fit Standard for 1½ or 2 inch pipe, if so ordered, but always fitted for 1¼ inch unless otherwise directed.

For Cylinders to go with this Standard see pages 48 to 54. Our Figs. 611 and 612 are usually employed.

THE GOULDS M'F'G CO.'S PUMP STANDARDS.

FOR DEEP WELLS.

For such wells we have built the Standards known as Figs. 236 and 237, for at least 18 to 20 years, and their increasing sales each year have given ample evidence of the esteem in which they were held by our patrons. While they have been used on wells 150 to 200 feet deep with perfect success, there has been a demand for a heavier Standard — one that was strong and heavy enough to stand plantation usage and the severe handling that careless employees usually give such things. To meet this we designed our Figs. 592 and 593, shown on pages 44 and 45. All four Standards are built on the same principle, you might say. That is, we find that Standards, when made in sections, are much more convenient for setting on wells than when they are made all in one casting. This is *the* distinguishing feature of these Standards, and we have introduced it into other kinds of our Pumps, as will be seen further on in our Catalogue. There are two ways of setting Pump Cylinders in wells. The more preferable way in our judgment is with the lower working cylinder at the *bottom of the well* in the water. Located here the valves are constantly submerged and do not get dried up, and therefore are in working condition always, however long the Pump may stand unused. There is no suction pipe with this method — simply connecting pipe — and should the joints leak air a little, the production of the Pump will only be diminished to the extent of the water that leaks back into the well; whereas a suction pipe that leaks air very materially, if not entirely, cripples the operation of the Pump. The second way, is to have the cylinder within suction distance of the water in the well (say 15 to 20 feet), and raising the water to the cylinder through a suction pipe by atmospheric pressure.

In ordering these Standards, therefore, we should have the following data:

1st. The size of gas pipe the Standard is to be fitted for.

2d. Whether the connecting rods are wanted for welding to the stub end of piston rod in lever, or threaded for gas-pipe couplings of a stated size.

In setting these Pumps we would call attention to the following:

Our Standards being formed by bolting together the top and lower sections, we recommend removing the top section, etc., when setting a Pump. Between the two sections of the Standard is a flange, which can be screwed for either 1¼,

1½, 2 or 2½ inch wrought-iron pipe, as ordered, into which the connecting pipe is coupled. Ascertain the distance from this flange to the point where you propose to locate the cylinder. Take random lengths of gas pipe sufficient to connect the Standard and cylinder together; then cut your rods of such lengths as that the joints will come just above the end of each length of pipe. Weld or couple on the first piece of connecting rod to the stub of piston rod in cylinder, of proper length to stick out of the end of first piece of pipe about two or three inches. Screw into cylinder the pipe, and let the whole down into the well. Then couple on another length of rod and pipe and lower again. It will be seen the joints of the connecting rod come outside the pipe all the time; whereas if they were midway in a length it would be impossible to unite them. Couple on another length of rod and pipe and lower again into the well, and continue doing so until the rods are connected with the polished rod which works through the stuffing box in top of stock, and the pipe is screwed into the flange. Then slip the top section over the end of rod, put in your lever and bolts, fasten Standard and brace to platform, and the Pump should be ready for successful operation. In cold climates a small hole about the size of a darning needle should be drilled in the connecting pipe about four feet below the platform, to let the water out of the standard and pipe to that point after using. Great care should be taken to have the ends of the rod touch each other in the coupling, as the coupling is then not so liable to jar loose. If suction pipe is used any of the distance, make perfectly air-tight joints. The polished rod can also be screwed out of the steeple piece, which will be found very convenient also. We make malleable-iron or brass couplings for connecting the rods, and tap them for 7-16 iron. The pipe in the well should be stayed so as to obviate swaying.

The deeper a well is the smaller the cylinder should be, and really the larger the connecting or suction pipe as compared with the size of the cylinder. We often furnish our double-acting cylinders with these Standards, but they should not be used in very deep wells.

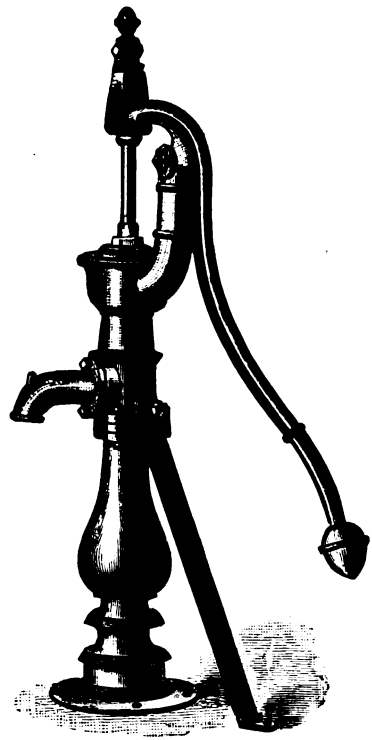
Our Figs. 237 and 593 always have a screw thread cut on the end of spout, with a coupling and hose tube screwed on for attaching hose, when they can be used in case of fire, also, for washing windows, wagons, etc. By putting a gas-pipe tee in the connecting pipe, say three or four feet from platform, a pipe can be run off horizontally in a trench to the house or barn, and water obtained there. To accomplish this, however, of course the spout must be closed, which we do by inserting a cock in the spout, as in Fig. 394.

We arrange all these Pumps complete with pipe and rods for wells of any depth, all ready to be placed in the well with very little trouble. Any ordinary person can put them up in this way.

THE GOULDS CLOSE TOP DEEP WELL PUMP STANDARD.

FOR WELLS UP TO 100 FEET DEEP.

FIG. 236.



The cut shows our Fig. 236 Deep Well Pump Standard. We can recommend it for wells up to 100 feet deep, though it is not so heavy and durable as Fig. 592, on page 44. When a few dollars extra expense is not considered, the most permanent thing being desired, and particularly in public wells and on estates where employees use the well, we would urge the purchase of Fig. 592, in preference to this Pump Standard. We can, however, remark that our Fig. 236 has been before the trade for at least 18 or 20 years, and has always been regarded as the best of the kind ever made.

Any size pipe from 1¼ to 2 in. can be used with this Standard, but always fitted for 1¼ in. unless otherwise ordered.

FIG. 236. Size, Price, Etc.

	Suction.	Stroke.	Height.	Weight.	Cipher.	Price.
Standard complete	1¼ in.	7 in.	51 in.	94 lbs.	Cane	$10.00

EXTRA FLANGES.

1¼ in. pipe, each, ... 50 cents.
1½ or 2 in. pipe, each, ... 60 cents.

For Cylinders to go with this Standard see pages 48 to 54. Our Deep Well Cylinders, Figs. 613 and 614, are most commonly employed.

THE GOULDS DEEP WELL FORCE PUMP STANDARD.

FOR WELLS UP TO 100 FEET DEEP.

FIG. 237.

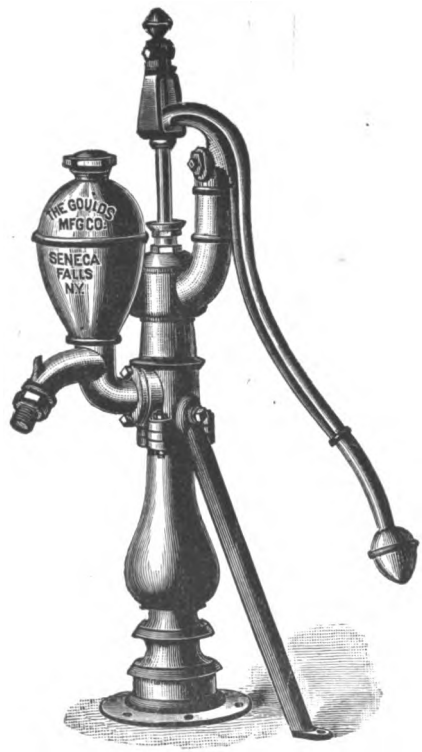


Fig. 237 represents our Deep Well Force Pump Standard, being same as Fig. 236, shown on opposite page, with the addition of an air chamber on the spout. There is a half hose coupling and tube for attaching hose on the spout. Loosen nut on top of air chamber when used for ordinary pumping and tighten it when used for forcing purposes.

Always fitted for 1¼ inch pipe unless ordered to the contrary, but we can fit them for 1½ or 2 inch pipe when so desired.

FIG. 237. Size, Price, Etc.

No.	Suction.	Stroke.	Height.	Weight.	Cipher.	Price.
1	1¼ in.	7 in.	51 in.	116 lbs.	Canon	$13.00
2	Same as above, with cock spout.				Cape	15.50

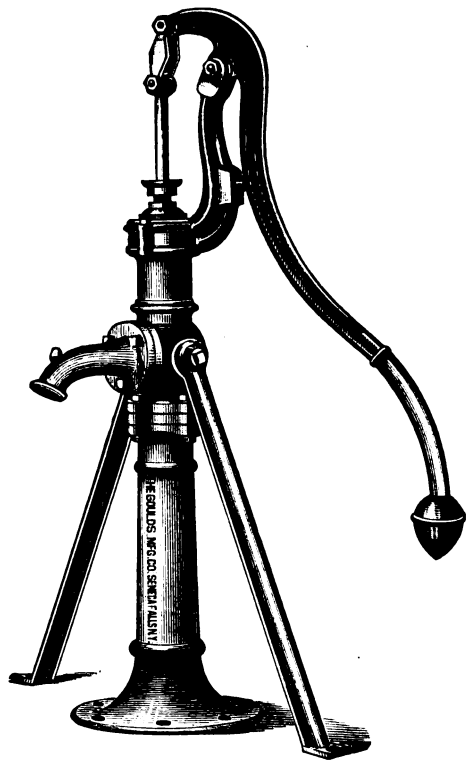
EXTRA FLANGES.

1¼ inch pipe, each, ... 50 cents.
1½ or 2 inch pipe, each, ... 60 "

For Cylinders to go with this Standard see pages 48–54. Our Deep Well Cylinders, Figs. 613 and 614, are most commonly employed.

NEW DEEP WELL PUMP STANDARD.

FIG. 592.



The cut accurately represents our New Deep Well Pump Standard. The manner of construction in two sections, with flange between, is plainly visible, and will be esteemed a very great convenience by those who have to set up these Pumps. It is very strong and heavy and will answer to use on wells from 100 to 300 feet deep. Any size from 1¼ inch to 2½ inch pipe can be used with this Standard, but always fitted as below unless ordered otherwise. For information about setting up these Standards, see pages 40 and 41.

FIG. 592. Size, Price, Etc.

	Suction.	Stroke.	Height.	Weight.	Cipher.	Price.
Standard complete,	1½ in.	7 in.	51 in.	132 lbs.	Mill	$16.00

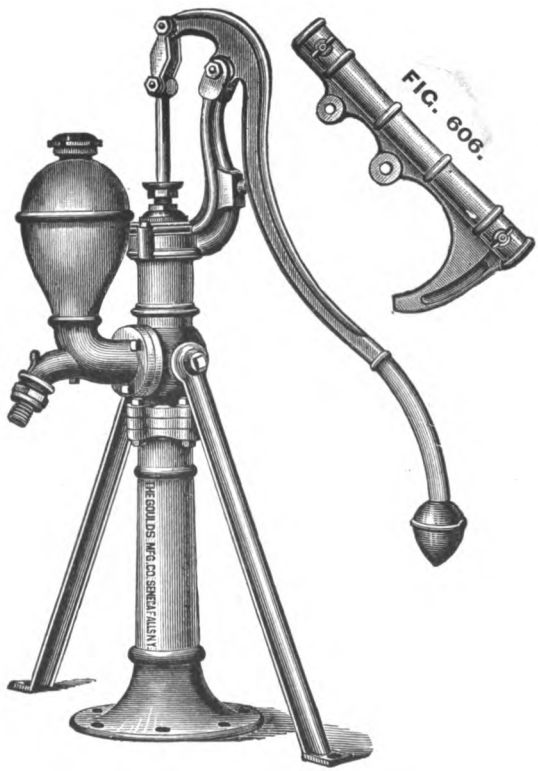
EXTRA FLANGES.

1¼ inch pipe, each, ... 50 cents.
1½, 2 and 2½ inch pipe, each, ... 60 cents.

For Cylinders to go with above, see pages 48 to 54. Our Figs. 613 or 614 are the most commonly employed.

NEW DEEP WELL FORCE PUMP STANDARD.

FIG. 593.



The above cut represents our New Deep Well Force Pump Standard. Our description of Fig. 592, on previous page, applies to this Pump, also our remarks on pages 40 and 41. Always fitted for 1½ inch pipe unless otherwise ordered, but we can fit them for pipe up to 2½ inches,

If ordered with brake for Wood Lever, like Fig. 606, we add $1.00 extra to list.

FIG. 593. Size, Price, Etc.

No.	Suction.	Stroke.	Height.	Weight.	Cipher.	Price.
1	1½ in.	7 in.	51 in.	153 lbs.	Milt	$20.00
2	Same as	above with	cock in	the spout	Milton	22.50

EXTRA FLANGES.

1¼ inch pipe, each, ... 50 cents.
1½, 2 and 2½ inch pipe, each, ... 60 cents.

For Cylinders for above see pages 48 to 54. Our Figs. 613 or 614 are the most commonly employed.

DEEP WELL FORCE PUMP STANDARD.

WITH HEAVY FLY WHEEL, FACE PLATE AND BABBITT-LINED CRANK SHAFT BOX.

FIG. 547.

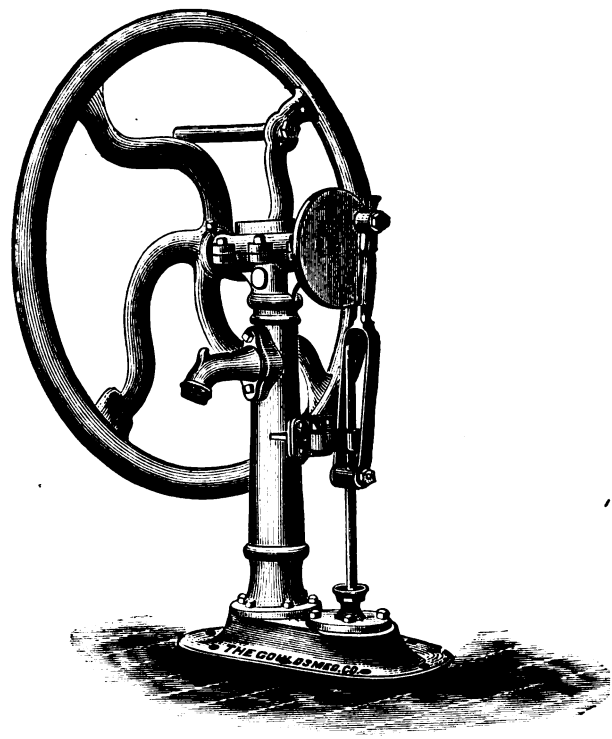


Fig. 547 is a new device for elevating water from deep wells, either by hand or power. When used by hand a large Fly Wheel is attached, as shown in the cut; for power, pulleys can be put on to be run by belt. The water passes upward through the column and is discharged from the spout. A flange can be attached in place of the spout when desired, to convey the water to any distance from or elevation above the Pump. When this flange is furnished in addition to spout (shown in cut) we add $1.00 extra to list. We can fit these Standards for 1¼ or 2 inch pipe, when so ordered, but always fit for 1½ inch unless otherwise directed.

FIG. 547. Size, Price, Etc.

No.	Suction.	Stroke.	Diameter Fly Wheel.	Floor Space	Weight.	Cipher.	Price.
1	1½	5, 6 or 7 in.	36 in.	14 x 20 in.	265 lbs.	Lamp	$39.00
2	Same, with pulley b		alance wh	eel like F	ig. 595.	Lane	41.00

For Cylinders to go with above see pages 48 to 54. Figs. 613, 614 or 548 Cylinders are the most commonly employed.

DEEP WELL FORCE PUMP STANDARD, GEARED.

WITH HEAVY PULLEY FLY WHEEL, FACE PLATE AND BABBITT-LINED CRANK SHAFT BOX.

FIG. 595.

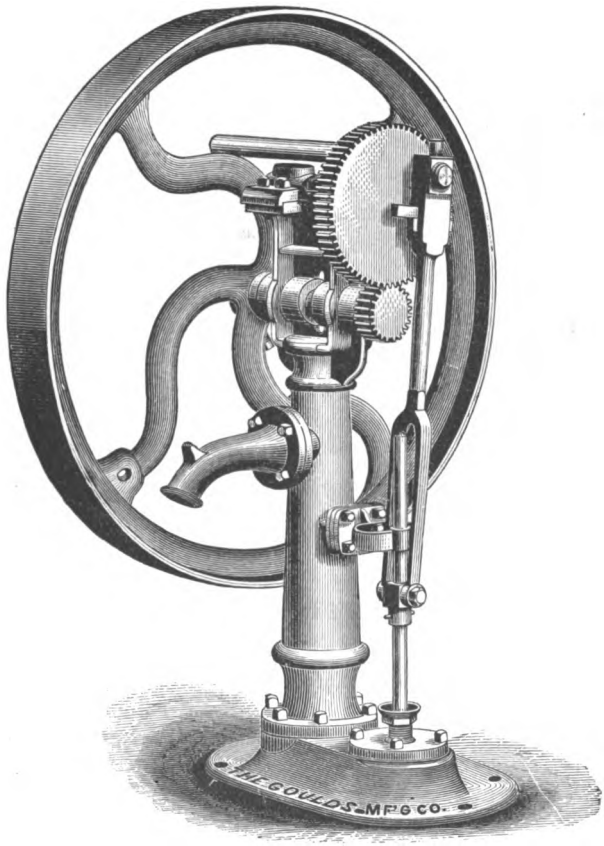


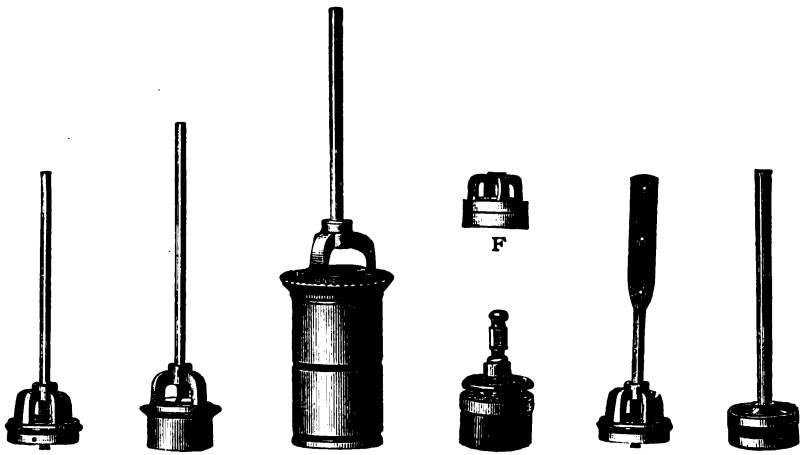
Fig. 595 is a new device for elevating water from very deep wells, either by hand or power. The fly wheel is extra heavy and large, on to which a belt can be run when desired to be used for power. It is geared with power of three to one, and, as can be seen, is both very substantial and as equipped is capable of raising water long distances. A flange can be attached in place of the spout when desired to convey the water to any distance from or elevation above the Pump. We can fit this Standard for 1¼ or 2 inch pipe but always fit for 1½ inch unless otherwise directed.

FIG. 595. Size, Price, Etc.

No.	Suction.	Stroke.	Diameter Fly Wheel.	Face of Fly Wheel.	Floor Space.	Weight.	Cipher.	Price.
1	1½ in.	7 in.	36 in.	4½ in.	14 x 20 in.	332 lbs.	Mink	$65 00
2	Same as abo	ve, with air	chamber.				Vexer	68.00
3	Same as abo	ve, with air	chamber a	nd cock	spout.		Vexil	70.00

See pages 48 to 54 for the Cylinders that go with this Standard. Figs. 613, 614 or 548 Cylinders are the most commonly employed.

CYLINDER PLUNGERS.



The cuts show the various styles of Plungers we use in our lower Cylinders described on pages 49 to 53.

"A" Plunger is an ordinary one, with leather packing and iron valve, used in Cylinders Figs. 609, 610 and 559.

"B" Plunger has a bail and valve and a follower 1½ inches long, turned to fit the walls of Cylinder close enough to produce a vacuum and at the same time has a leather packing besides. It is used in Cylinders Figs. 611 and 612.

"C" Plunger has a bail and valve and a follower about five inches long, with grooves, as shown in cut. The Plunger fits the Cylinder as closely as any steam engine piston, and is the best of the kind ever made. A leather packing also is placed between bail and follower, which adds much to its effectiveness. This style is used in Figs. 613, 614, 615 and 548.

"E" Plunger is of entirely new construction, with the rod running down through it and with a follower two inches long and disc valve closing over a faced valve seat. It goes in Cylinder Fig. 617.

"F" Plunger is all brass with stem valve and follower *turned* to fit walls of cylinder. We put cup leather packings on this plunger. Used in Cylinder Fig. 616.

"G" Plunger is our ordinary one, the same as "A" style, only that the rod is flat for attaching to wood piston rod. It goes in Cylinder Fig. 620.

"H" Plunger is a *solid one* and packed at top and bottom with cup leathers. This plunger is *only* used in Double Acting Cylinders, like our Fig. 621.

THE GOULDS MANUFACTURING CO.'S CELEBRATED CYLINDERS.

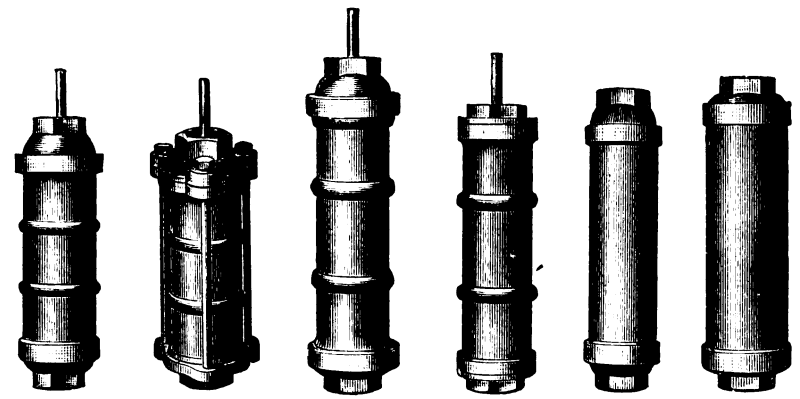


FIG. 609. FIG. 610. FIG. 611. FIG. 612. FIG. 616. FIG. 617.

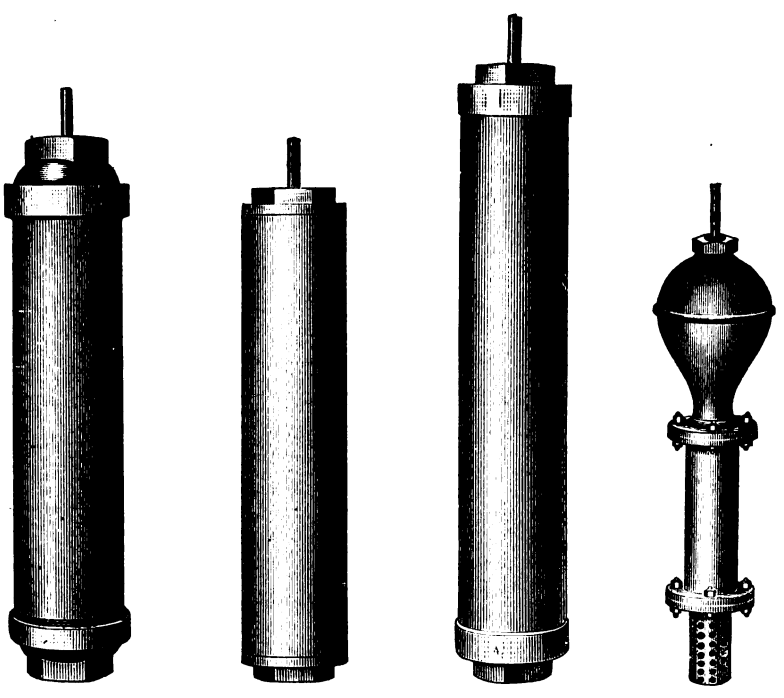


FIG. 613. FIG. 614. FIG. 615. FIG. 548.

See pages 51 to 54 for prices.

THE GOULDS MANUFACTURING CO.'S CELEBRATED CYLINDERS.

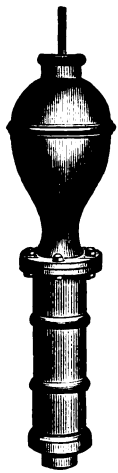


FIG. 559 1-2.

FIG. 620.

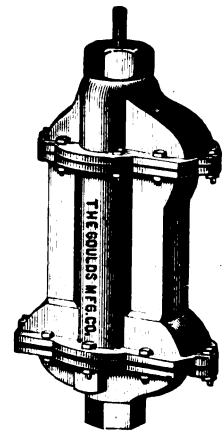


FIG. 621.

Every one knows that the Cylinder is the Pump; by means of that, water is raised. If the Cylinder is defective the Standard is of no account, no matter how attractive it may be in its appearance. It will be seen from the following table that we manufacture a large line of working Cylinders, and we are prepared to say that they are all well made in every respect and can be relied on under all circumstances. Our Figs. 613, 614 and 615 are particularly well built, and are known as our Deep Well Cylinders. Please refer to the Fig. in all cases in ordering, and there will then be no mistake.

Piston Rods are *always* made with stub for welding, unless ordered otherwise.

Cylinders are always shipped both ends screwed for sizes named in tables, unless ordered otherwise. If wanted with Strainer at bottom, please indicate it.

We put our "Patent Sand Valve" on Figs. 609, 610 and 611 *invariably*, and on Figs. 612, 613, 614 and 615 when *ordered* so, at no extra charge.

Our technical names of different parts comprising a working Cylinder are:

Body or Shell of Cylinders.
Top Attachment.
Bottom Attachment.
Plunger (meaning Plunger complete).
Bail or Cage.
Follower or Bottom of Plunger.
Lower Valve.

Figs. 609 and 610, 6 inches stroke.
" 611 8 "
" 612 7 "
" 613 9 "
" 614 7 "

Figs. 615, 11 inches stroke.
" 616, 10½ in. long, 6 in. stroke.
" 616, 12 " 10 "
" 617, 7 "

See pages 51 to 54 for prices.

We can fit any of our Cylinders with metallic valves throughout, for pumping hot or corrosive liquids, to order.

THE GOULDS MANUFACTURING CO.'S CELEBRATED BORED, REAMED AND POLISHED CYLINDER. SIZES AND PRICES.

GAS SET CYLINDER.

FIG. 609. Outside Attachments. "A" Plunger.

No.	Size, inches.	Fitted for, in.	IRON.		BRASS BODY, IRON PLUNG. AND ATT'S.		BRASS BODY AND PLUNG., IRON ATT'S.		ALL BRASS.	
			Cipher.	Price.	Cipher.	Price.	Cipher.	Price.	Cipher.	Price.
1	2¼ x 9	1	Move	$4.00	Vermin	$7.50	Versicle	$8.25	Tremor	$9.00
2	2½ x 9	1¼	Much	4.35	Vernal	8.00	Versify	8.75	Tren	9.50
3	2¾ x 9	1¼	Muck	4.70	Vernant	8.75	Version	9.75	Trench	10.50
4	3 x 9	1¼	Muff	5.00	Vernate	9.50	Verst	10.50	Trend	11.50
5	3¼ x 9	1¼	Mule	5.30	Vernier	10.50	Vert	11.50	Trepid	12.50
6	3½ x 9½	1½	Mull	5.60	Veronica	11.50	Vertebra	12.50	Tress	14.00
7	3¾ x 10	1½	Mum	5.90	Verse	13.00	Vertex	14.00	Tret	15.50
8	4 x 10	1½	Mumps	6.50	Verser	14.00	Vertical	15.00	Trevet	17.00

GAS SET CYLINDER.

FIG. 610. Bolt Attachments. "A" Plunger.

No.	Size, inches.	Fitted for, in.	IRON.		BRASS BODY, IRON PLUNG. AND ATT'S.		BRASS BODY AND PLUNG., IRON ATT'S.		ALL BRASS.	
			Cipher.	Price.	Cipher.	Price.	Cipher.	Price.	Cipher.	Price.
1	2¼ x 9	1	Murky	$4.00	Vestal	$7.50	Vetch	$8.25	Trey	$9.00
2	2½ x 9	1¼	Muse	4.35	Vested	8.00	Vetchy	8.75	Tri	9.50
3	2¾ x 9	1¼	Musk	4.70	Vestige	8.75	Veteran	9.75	Triad	10.50
4	3 x 9	1¼	Muss	5.00	Vesting	9.50	Veto	10.50	Trial	11.50
5	3¼ x 9	1¼	Must	5.30	Vestment	10.50	Vetust	11.50	Tribe	12.50
6	3½ x 9½	1½	Mute	5.60	Vestry	11.50	Vex	12.50	Triblet	14.00
7	3¾ x 10	1½	Name	5.90	Vesture	13.00	Vexation	14.00	Tribune	15.50
8	4 x 10	1½	Nape	6.50	Vesuvian	14.00	Vexatious	15.00	Tribute	17.00

SHALLOW WELL CYLINDER.

FIG. 611. Outside Attachments. "B" Plunger.

No.	Size, inches.	Fitted for, in.	IRON.		BRASS BODY, IRON PLUNG. AND ATT'S.		BRASS BODY AND PLUNG., IRON ATT'S.		ALL BRASS.	
			Cipher.	Price.	Cipher.	Price.	Cipher.	Price.	Cipher.	Price.
1	2¼ x 11½	1	Navy	$5.75	Topan	$10.50	Towser	$11.50	Trice	$13.00
2	2½ x 11½	1¼	Neal	6.00	Topaz	11.50	Toy	12.50	Trick	14.00
3	2¾ x 11½	1¼	Neap	6.50	Tope	11.75	Toyer	13.25	Tricked	15.00
4	3 x 11½	1¼	Near	7.00	Topet	12.75	Toying	14.25	Tricking	16.25
5	3¼ x 11½	1¼	Neat	7.50	Topic	14.00	Toze	15.00	Trickle	17.50
6	3½ x 11½	1½	Neck	8.00	Topped	15.50	Track	17.50	Tricksy	20.00
7	3¾ x 11½	1½	Need	8.50	Topple	18.00	Tracking	20.50	Tride	23.50
8	4 x 11½	1½	Nest	9.25	Torch	21.50	Tractor	24.00	Trident	27.50

SHALLOW WELL CYLINDER.

FIG. 612. Inside Attachments. "B" Plunger.

No.	Size, inches.	Fitted for, in.	IRON.		BRASS BODY, IRON PLUNG. AND ATT'S.		BRASS BODY AND PLUNG., IRON ATT'S.		ALL BRASS.	
			Cipher.	Price.	Cipher.	Price.	Cipher.	Price.	Cipher.	Price.
1	2¼ x 11½	1	New	$5.75	Tore	$10.50	Traduce	$11.50	Triding	$13.00
2	2½ x 11½	1¼	Next	6.00	Torment	11.50	Tragic	12.50	Trier	14.00
3	2¾ x 11½	1¼	Nice	6.50	Torn	11.75	Trail	13.25	Trifid	15.00
4	3 x 11½	1¼	Nich	7.00	Torpent	12.75	Trailed	14.25	Trifle	16.25
5	3¼ x 11½	1¼	Nick	7.50	Torpid	14.00	Trailing	15.00	Trig	17.50
6	3½ x 11½	1½	Nine	8.00	Torpor	15.50	Train	17.50	Trigger	20.00
7	3¾ x 11½	1½	Node	8.50	Torrent	18.00	Trainer	20.50	Trigon	23.50
8	4 x 11½	1½	None	9.25	Torse	21.50	Trainy	24.00	Trill	27.50

Add from 1-2 to 9-16 inch to get *outside* diameter of cylinder.

DEEP WELL CYLINDER.

FIG. 613. Outside Attachments. "C" Plunger.

No.	Size, inches.	Fitted for, in.	IRON.		BRASS BODY, IRON PLUNG. AND ATT'S.		BRASS BODY AND PLUNG., IRON ATT'S.		ALL BRASS.	
			Cipher.	Price.	Cipher.	Price.	Cipher.	Price.	Cipher.	Price.
1	2¼ x 16	1¼	Nose	$6.50	Torsion	$12.00	Traitor	$13.50	Trimly	$15.00
2	2½ x 16	1¼	Note	7.00	Torso	12.50	Traject	14.00	Trinal	15.00
3	2¾ x 16	1¼	Now	7.50	Torsten	13.00	Tramp	14.50	Trine	16.25
4	3 x 16	1¼	Nude	8.00	Tort	14.00	Tramper	15.50	Trior	17.50
5	3¼ x 16	1½	Null	8.50	Tortil	16.00	Trance	18.00	Trip	20.00
6	3½ x 16	1½	Numb	9.00	Tortive	18.50	Transom	21.00	Tripe	23.40
7	3¾ x 16	1½	Oaks	9.50	Tortoise	22.50	Trap	25.00	Triple	27 50
8	4 x 16	1½	Obey	10.50	Torture	26.00	Trapan	29.00	Tripod	32.50
10	4½ x 16	2	Obeyed	14.00	Vertigo	30.00	Vervels	35.00	Vesicant	40.00
12	5 x 16	2½	Vile	17.00	Villa	33.00	Villager	39.00	Villous	45.00
12	5 x 18	2½	Obfirm	20.00	Vervain	37.00	Very	43.00	Vesicate	50.00
16	6 x 16	3	Viled	23.00	Village	42.00	Villain	50.00	Viminal	60.00

DEEP WELL CYLINDER.

FIG. 614. Inside Attachments. "C" Plunger.

No.	Size, inches.	Fitted for, in.	IRON.		BRASS BODY, IRON PLUNG. AND ATT'S.		BRASS BODY AND PLUNG., IRON ATT'S		ALL BRASS.	
			Cipher.	Price.	Cipher.	Price.	Cipher.	Price.	Cipher.	Price.
000	1½ x 16	1							Tripoli	$12.50
00	1¾ x 16	1¼	We do n	ot mak	e these si	zes exc	ept in all	brass.	Tripos	12.50
0	2 x 16	1¼							Trite	13.50
1	2¼ x 16	1¼	Odor	$6.50	Trowel	$12.00	Trashy	$13.50	Triton	15.00
2	2½ x 16	1¼	Ogee	7.00	Troy	12.50	Trass	14.00	Trivant	15.00
3	2¾ x 16	1¼	Ogle	7.50	Truce	13.00	Trave	14.50	Trivet	16.25
4	3 x 16	1¼	Ogre	8.00	Truck	14.00	Travel	15.50	Troat	17.50
5	3¼ x 16	1½	Oils	8.50	True	16.00	Travers	18.00	Troche	20.00
6	3½ x 16	1½	Olio	9.00	Trug	18.50	Tray	21.00	Troll	23.40
7	3¾ x 16	1½	Omen	9.50	Trull	22.50	Tread	25.00	Trod	27.50
8	4 x 16	1½	Omit	10.50	Truly	26.00	Treason	29.00	Trone	32.50
10	4½ x 16	2	Once	14.00	Vesicle	30.00	Vessel	35.00	Vessicon	40.00
12	5 x 16	2½	Vilely	17.00	Vilify	33.00	Villakin	39.00	Villatic	45.00
12	5 x 18	2½	Onion	20.00	Vesper	37.00	Vessets	43.00	Vest	50.00
16	6 x 16	3	Vileness	23.00	Vility	42.00	Villany	50.00	Villi	60.00

Add from 1-2 to 9-16 inch to get *outside* diameter of cylinder.

ARTESIAN CYLINDER.

FIG. 615. Inside Attachments. "C" Plunger.

No.	Size.	Fitted for	IRON.		BRASS BODY AND PLUNG., IRON ATT'S.		ALL BRASS.	
			Cipher.	Price.	Cipher.	Price.	Cipher.	Price.
00	1¾ x 20 in.	1 or 1¼ in.	Only	$7 50	Treat	$13 75	Trope	$15.00
0	2 x 20 "	1¼ "	Ooze	7.50	Treated	14.50	Trot	16.00
1	2¼ x 20 "	1¼ "	Opal	8.00	Treaty	15.50	Trough	17.00
2	2½ x 20 "	1¼ "	Open	8.50	Treble	16.50	Troul	18.00
3	2¾ x 20 "	1¼ "	Oral	9.00	Tree	18.25	Trout	20.00
4	3 x 20 "	1¼ "	Orbs	9.50	Treen	20.50	Trover	22.50
5	3¼ x 20 "	1¼ or 1½	Otto	10.00	Trellis	23.00	Trow	25.00
8	4 x 20 "	1½ or 2	Vivary	12.50	Vive	36.00	Vivency	40.00

Add from 1-2 to 9-16 inch to get *outside* diameter.

WOOD PUMP CYLINDER.

FIG. 620. "C" Plunger.

No.	Size.	Fitted for.	IRON.	
			Cipher.	Price.
4	3 x 11½ in.	1¼ in.	Quay	$3.00
5	3¼ x 11½ "	1¼ "	Quell	4.00
7	3¾ x 11½ "	1½ "	Query	4.50

IRON CYLINDERS LINED WITH SEAMLESS BRASS TUBES.

SHALLOW WELL CYLINDER.

FIG. 611. Outside Attachments. "B" Plunger.

No.	Size.	Fitted for	BRASS CAGE AND VALVE, WITH IRON FOLLOWER.		ALL BRASS PLUNGER.	
			Cipher.	Price.	Cipher.	Price.
1	2¼ x 11½ in.	1 in.	Trump	$8.00	Twangle	$9.00
2	2½ x 11½ "	1¼ "	Trunk	8.50	Twank	9.50
3	2¾ x 11½ "	1¼ "	Truss	9.00	Twattle	10.00
4	3 x 11½ "	1¼ "	Trust	9.50	Tway	10.50
5	3¼ x 11½ "	1¼ "	Truth	10.00	Tweag	11.25
6	3½ x 11½ "	1½ "	Try	10.50	Tweedle	12.00
7	3¾ x 11½ "	1½ "	Tub	11.50	Tweel	13.50
8	4 x 11½ "	1½ "	Tuber	12.50	Tweezers	15.00

DEEP WELL CYLINDER.

FIG. 613. Outside Attachments. "C" Plunger.

No.	Size.	Fitted for	BRASS CAGE AND VALVE, IRON FOLLOWER.		ALL BRASS PLUNGER.	
			Cipher.	Price.	Cipher.	Price.
1	2¼ x 16 in.	1¼ in.	Twig	$9.50	Twinkle	$10.75
2	2½ x 16 "	1¼ "	Twiggen	10.00	Twinkling	11.50
3	2¾ x 16 "	1¼ "	Twiggy	10.50	Twinter	12.00
4	3 x 16 "	1¼ "	Twill	11.00	Twire	12.75
5	3¼ x 16 "	1½ "	Twin	11.50	Twirled	13.75
6	3½ x 16 "	1½ "	Twined	12.00	Twist	14.50
7	3¾ x 16 "	1½ "	Twinge	13.50	Twisted	16.50
8	4 x 16 "	1½ "	Twining	15.75	Twisting	19.00

SEAMLESS BRASS TUBE WIND MILL CYLINDER.

FIG. 616. Outside Attachments. "F" Plunger.

No.	Size.	Fitted for.	BRASS BODY AND PLUNGER, IRON ATTACHMENTS.		ALL BRASS.	
			Cipher.	Price.	Cipher.	Price.
1	2¼ x 10½ in.	1 in.	Touchy	$7.75	Vincible	$8.50
2	2½ x 10½ "	1¼ "	Toughen	8.00	Vindicate	8.75
3	2¾ x 10½ "	1¼ "	Tourist	8.50	Vine	9.25
4	3 x 10½ "	1¼ "	Tourney	9.00	Vined	10.00
1	2¼ x 12 "	1 "	Tough	8.25	Vinegar	9.25
2	2½ x 12 "	1¼ "	Tour	8.50	Vinegrub	9.50
3	2¾ x 12 "	1¼ "	Tourn	9.00	Viner	10.00
4	3 x 12 "	1¼ "	Touse	9.50	Vinery	11.00
6	3½ x 12 "	1½ "	Toward	11.25	Vineyard	13.50
8	4 x 12 "	1½ "	Town	15.00	Vinous	18.50

SPECIAL WIND MILL AND DEEP WELL CYLINDER.

FIG. 617. Inside Attachments. "E" Plunger.

No.	Size.	Fitted for.	BRASS BODY, IRON PLUNG. AND ATT'S.		BRASS BODY AND PLUNG., IRON ATT'S.		ALL BRASS.	
			Cipher	Price.	Cipher.	Price.	Cipher.	Price.
4	3 x 12 in.	1¼ in.	Torus	$12.00	Vintry	$14.50	Violent	$16.50
6	3½ x 12 "	1½ "	Tory	13.75	Viny	17.50	Violin	20.00
8	4 x 12 "	1½ "	Toss	15.00	Viol	24.00	Violinist	29.00
12	5 x 14 "	2½ "	Tossed	25.25	Violate	35.00	Violist	40.00
16	6 x 14 "	2½ "	Tossing	30.00	Violator	44.50	Violono	52.00
20	8 x 14 "	3 "	Tost	50.00	Violence	65.00	Viper	72.00

DEEP WELL CYLINDER WITH AIR CHAMBER.

FIG. 548. "C" Plunger.

No.	Size.	Fitted for.	IRON.	
			Cipher.	Price.
3	2¾ x 16 in.	1¼ in.	Lap	$11.00
4	3 x 16 "	1¼ "	Lard	11.50
5	3¼ x 16 "	1½ "	Lark	12.00
6	3½ x 16 "	1½ "	Lash	12.50
7	3¾ x 16 "	1½ "	Last	13.00
8	4 x 16 "	1½ "	Late	14.00

DEEP WELL CYLINDER WITH AIR CHAMBER.

FIG. 559 1-2. "A" Plunger.

No.	Size.	Fitted for.	IRON.	
			Cipher.	Price.
4	3 x 12 in.	1¼ in.	Lawn	$ 9.00
8	4 x 12 "	1½ "	Lax	11.50

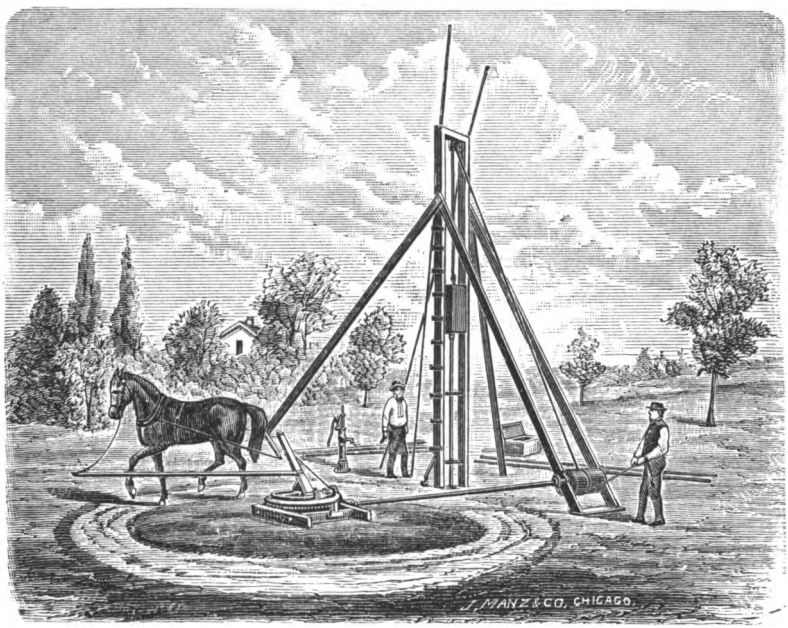
DOUBLE ACTING CYLINDER.

FIG. 621. "H" Plunger.

No.	Size.	Fitted for.	IRON.	
			Cipher.	Price.
1	2¼ x 6 in.	1¼ in.	Quib	$10.00
4	3 x 6 "	1½ "	Quick	12.00
8	4 x 6 "	2 "	Quid	14.00
8	4 x 10 "	2 "	Quiet	20.00

TUBULAR WELL DRILLING MACHINE.

FIG. 777.



This cut shows in practical operation the *Pioneer* Tubular Well Machine, the block and rope being operated by hand. The Derrick is made 22 feet high, which well drivers find most convenient, as they can then use long lengths of tubing, and save valuable time, which is always lost with a shorter machine.

Lack of space prevents our giving an extended description of this well-known machine, of which there are hundreds in successful operation, in all sections of the country. We will, however, take pleasure in mailing upon application, to any address, our special catalogue of Tubular Well Machinery with full descriptions and directions for use.

To parties emigrating, and in fact all who wish to put down wells for their own use, instead of following it for a business, we recommend this machine. It is compact and simple, and with our instructions can be operated by any one.

FIG. 777, Prices With the Following Outfits:

No. 1 Outfit.—This outfit is for 2-inch wells of 50 to 150 feet in depth, and consists of above machine, horse-power, tumbling-rod, sweep, rope, 150 feet sand-rods, five pairs tongs, die-plate with 1-inch and 2-inch dies, pipe-cutter, drive-head, two-drill sand-pumps, screen sand-pump, heavy drill, valve and screen sets, chisel and punch, swivel, grab-hook, jars, brace and bit, draw knife, saw and tape-line, ... $175.00

No. 2 Outfit.—This outfit is for 2-inch wells of 50 to 300 feet in depth, and consists of the same articles as No. 1, except that there are 300 feet of sand-rods, and a heavier horse-power, with two sweeps, is substituted, . . $200.00

THE NEWELL AND LUCASSE CYLINDER.

FOR SHALLOW, OPEN OR DRIVE WELLS.

FIG. 778.

The so-called drive well is entirely different from the tubular well in every particular, the screen and Cylinder containing the valves being all driven at once, and pipe about one-half the diameter of the Cylinder being used. As if this was not enough to make the common drive well work extremely hard, iron plunger-rods are used, whose weight, added to the friction produced by water passing through Cylinder and pipe of unequal diameters, makes one of 15 feet depth work harder than a tubular well 100 feet deep. To repair a common drive well, it is necessary to pull the whole well, or else dig down and unscrew the Cylinder so as to get at the check and plunger; and in three cases out of five a new Cylinder must be put in.

That is the old plan; now see ours: We use a Cylinder exactly like our tubular well Cylinder, except that it is only 16 inches long, with a reducing coupling at bottom to screw screen to. The valves are the same, only of different size — the valves of one will not fit the Cylinder of the other. The pipe above Cylinder to be of same diameter as Cylinder itself, so that the check valve and plunger can be put in after the well is driven, and are put in the same as in a tubular well. We use ash rods, which will float; and thus made, our Pump will work three times as easy as the old way. To repack plunger, it is taken up through the Pump. We make these cylinders in three sizes, 2, 2½ and 3 inches.

FIG. 778. Sizes, Prices, Etc.

No.	Length.	Diameter Cylinder.	Size Pipe.	Filter Point.	Price.
2	16 in.	2 in.	2 in.	1¼ x 24 in.	$12.00
3	16 "	2½ "	2½ "	1¼ x 24 "	15.00
4	16 "	3 "	3 "	1½ x 30 "	20.00

THE NEWELL & LUCASSE NON-PACKING VALVES.

FIG. 728.

A very good idea of this Well can be had from the accompanying cut. It shows the bottom section, and contains all the working parts of our Tubular Well in their proper places. The Working Barrel or Cylinder is four feet in length, and is made of the best lap-welded wrought-iron tubing — extra strong,— being twice the thickness of common pipe. After the Cylinder is completed, the outside diameter remains the same, but the inside is of three different diameters: the lower one being the smallest, and terminating at the top in a shoulder, on which the strainer coupling rests; the next largest terminates in a tapering Valve Seat, in which the Check Valve is seated, and the largest forming the chamber in which the plunger works.

The Plunger Chamber is smaller in diameter than common pipe — which not only allows the Plunger to be removed very easily, but prevents the leather from being worn out in passing through rough pipe. This Chamber is bored out and then polished as smooth as a gun barrel, and, being so hard, will never wear rough.

The Valves are made entirely of brass and will last forever, there being nothing to rust. The tapering Valve-Seat for the Check Valve is made with a reamer of exact size and shape as the Check Valve itself, so that when the latter is seated securely, no pressure that could be applied, even of steam, would cause it to leak. We have never known one of our Wells to leak from that cause.

The lower shoulder, on which the Strainer coupling rests, is perfectly square, and the coupling is turned to fit the bore exactly, so that no sand can possibly get past.

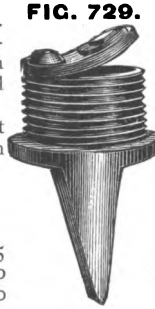
In addition to the above valuable qualities of this Well the Cylinder is made with a heavy steel ring welded to the bottom of it, to prevent the edges from turning in or breaking off when driven through gravel, hardpan, or stony soil of any description. This steel ring is of cold-chisel temper, and thus armed our Cylinder can be driven where none other could possibly go. If sent without the Point a deduction will be made.

FIG. 728. Sizes and Prices.

No.	Length.	Diam. Cyl.	Size Pipe.	Filter Point.	Price.
2	48 in.	2 in.	2 in.	1¼×51 in.	$20.00
3	48 "	2½ "	2½ "	1¼×51 "	25.00
4	48 "	3 "	3 "	1½×63 "	40 00

SAND-PUMP AND DRILL COMBINED.

FIG. 729.



This little tool is worth its weight in gold to the well-driver. The drill keeps the sand and gravel loose, and it is astonishing in how short a time two lengths of sand-pump rods can be filled. These tools are made of the best steel, and will stand any amount of hard drilling.

The opening at bottom is as large as can be made without weakening it, and the amount and size of gravel, etc., which can be picked up will surprise the uninitiated.

FIG. 729. Sizes and Prices.

GAS PIPE THREAD.	SIZE OF BIT.	NET.
1 inch,	1¾ inch,	$1.25
1¼ "	2 "	3.00
1½ "	2½ "	4.50
2 "	3 "	6.40

VERTICAL AND HORIZONTAL IRON CHECK AND FOOT VALVES.

WITH LEATHER VALVES.

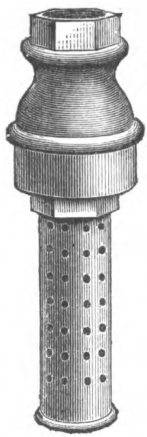


FIG. 471.

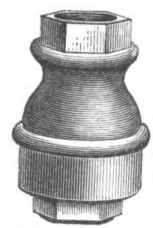


FIG. 472.

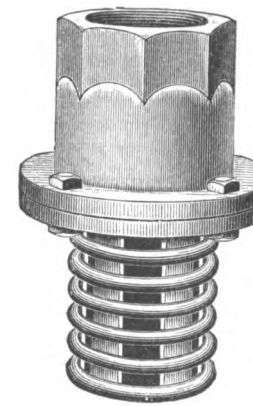


FIG. 473.

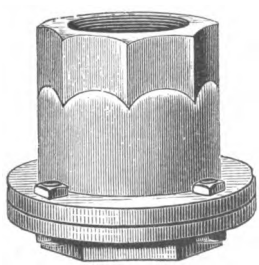


FIG. 474.

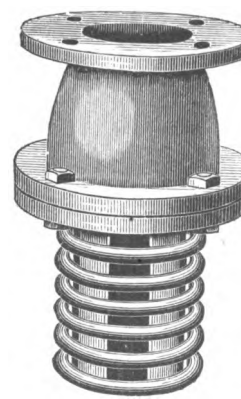


FIG. 475.

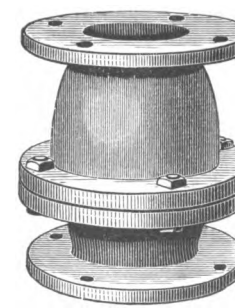


FIG. 476.

FIG. 667.

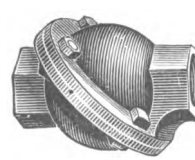


FIG. 742.

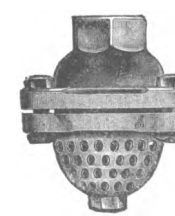


FIG. 760.

For prices and description, see table on opposite page.

CHECK AND FOOT VALVES. DESCRIPTION AND PRICES.

SIZE, INCHES.	¾	1	1¼	1½	2	2½	3	3½	4	4½	5	6
Fig. 471. Foot Valve, upper end cut Gas Pipe thread, with Strainer,	$1.75	$2.00	$2.25	$2.50	$3.00	$3.50	$4.50	. . .	. . .	. . .	. . .	. . .
Fig. 472. Check Valve, both ends cut Gas Pipe thread,	1.75	2.00	2.25	2.50	3.00	3.50	4.50	. . .	. . .	. . .	. . .	. . .
Fig. 473. Foot Valve, one end cut Gas Pipe thread, and Flanged Strainer,	. . .	. . .	. . .	. . .	. . .	4.75	5.75	$7.00	$8.50	$10.00	$12.00	$15.00
Fig. 474. Check Valve, one end cut Gas Pipe thread, and Gas Pipe Flanges at bottom,	. . .	. . .	. . .	. . .	. . .	. . .	. . .	7.00	8.50	. . .	. . .	. . .
Fig. 475. Foot Valve, with Flanges and Flanged Strainer,	. . .	. . .	. . .	. . .	4.00	4.75	5.75	7.00	8.50	10.00	12.00	15.00
Fig. 476. Check Valve, with Flanges and Bolts at both ends,	. . .	. . .	. . .	. . .	4.25	5.00	6.00	7.25	8.75	10.50	12.75	16.00
Fig. 667. Check Valve, both ends cut Gas Pipe thread,	1.50	1.75	2.00	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Fig. 760. Foot Valve, upper end Gas Pipe thread, with Strainer,	1.25	1.25	1.50	1.75	2.25	2.75	. . .	. . .	. . .	. . .	. . .	. . .
Fig. 742. *Horizontal* Check Valve, both ends Gas Pipe thread,	1.00	1.20	1.40	1.75	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Number of holes drilled in Check Valves and Flanges in Figs. 475 and 476.	. . .	. . .	. . .	. . .	3	4	4	4	4	4	6	6
Diameter of holes,	. . .	. . .	. . .	. . .	½	9-16	9-16	9-16	9-16	9-16	9-16	9-16
Diameter of circles on which centres of holes are drilled,	. . .	. . .	. . .	. . .	4¼	5⅛	5⅝	6⅜	7	7¼	7⅜	9
Diameter of Flanges at ends of Check Valves,	. . .	. . .	. . .	. . .	5½	6¼	6¾	7⅜	8¼	8½	9	10½
Diameter of Gas Pipe Flanges,	. . .	. . .	. . .	. . .	5½	6¼	6¾	7⅜	8¼	8½	. . .	. . .
	. . .	. . .	. . .	. . .	. . .	. . .	. . .	7¾	8⅝	. . .	. . .	. . .

STRAINER AND REST FOR SUCTION PIPE.

FIG. 222.

Fig. 222 shows a new device for the end of a suction pipe. It acts as a strainer and also steadies the pipe and prevents it from vibrating. The point wants to be forced into the bottom of the well.

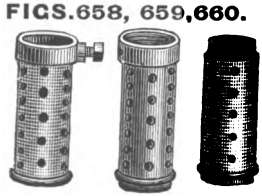
FIG. 222. Sizes, Prices, Etc.

Size Pipe.	Cipher.	Plain.	Cipher.	Galvanized.
1 in.	Bone	$0.70	Brace	$0.90
1¼ "	Book	.75	Brag	.95
1½ "	Boot	.87	Braid	1.05
2 "	Bore	1.12	Brain	1.40
2½ "	Born	1.25	Brake	1.60
3 "	Both	1.75	Brand	2.10

STRAINERS FOR WROUGHT-IRON SUCTION PIPE.

Sizes, Prices, Etc.

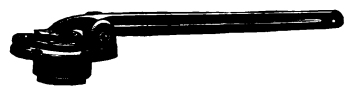
FIGS. 658, 659, 660.



Sizes, inches, . . .	1	1¼	1½	2	2½	3
Fig. 658, Plain, . .	$0.50	$0.60	$0.85	$1.10	$1.65	$2.25
" Galvanized, .	.60	.85	1.10	1.65	2.25	2.75
" Gal. & Cov'd,	.85	1.10	1.65	2.25	2.75	3.25
Fig. 659, Plain, . . .	.40	.50	.75	1.00	1.50	2.00
" Galvanized, .	.50	.75	1.00	1.50	2.00	2.50
" Gal. & Cov'd,	.75	1.00	1.50	2.00	2.50	3.00
Fig. 660, Plain, . . .	.40	.50	.75	1.00	1.50	2.00
" Galvanized, .	.50	.75	1.00	1.50	2.00	2.50
" Gal. & Cov'd,	.75	1.00	1.50	2.00	2.50	3.00

FLOAT VALVES FOR TANKS.

FIG. 740. **FIG. 656.** **FIG. 657.**



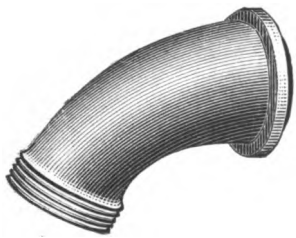
Sizes, Prices, Etc.

Size, inches,	¾ in.		1 in.		1¼ in.	
	Cipher.	Price.	Cipher.	Price.	Cipher.	Price.
Fig. 656, ...	Virelay	$0.60	Virge	$0.60	Virgo	$0.75
Fig. 657, ...	Virent	.80	Virgin	.80	Virile	1.00
Fig. 740, ...	Virgate	1.00	Virginal	1.00	Virtu	1.25

We shall soon have ready for market 1½ and 2 inch, Fig. 656, and solicit orders for same.

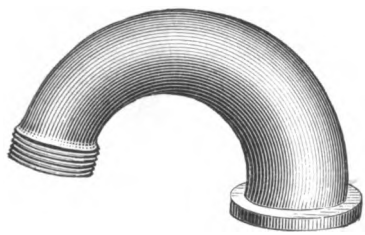
GOOSE NECKS FOR HOSE.

FIG. 492.



GOOSE NECK, QUARTER TURN.

FIG. 493.



GOOSE NECK, HALF TURN.

The cuts show Goose Necks we make for the various kinds of our Force Pumps, with threads cut on extremity for hose and for pumping into a pail when desired.

Sizes and Prices.

Fitted for Hose Coupling, . .	¾ in.	1 in	1¼ in.	1½ in.	2 in.
Fig. 492, ... Price	$0.40	$0.40	$0.50	$0.60	$0.75
Fig. 493, ... Price	.50	.50	.65	.80	1.00

AIR CHAMBERS FOR FORCE PUMPS.

FIG. 487.

FIG. 488.

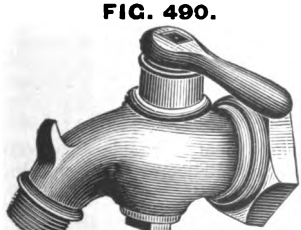
FIG. 489.

The cuts show different styles of Air Chambers we make, which are adapted to any of our hand or single-acting House Force Pumps, with few exceptions. These will take the place of check valves without any extra fitting. In ordering chambers to replace broken ones, it would be well to name the number of bolt holes, as we used to put in three holes, whereas we now put four.

Prices.

FIG. 487, each, . . $2.00 | **FIG. 488,** each, . . $2.00 | **FIG. 489,** each, . . $2.50

FIG. 490.



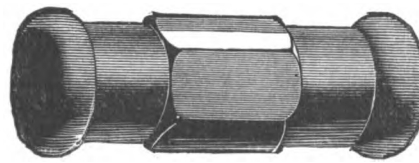
The cut represents an Iron Cock with brass plug. It has a coupling nut with right and left-handed threads cut in to fit the pumps enumerated below. We make two sizes.

Sizes and Prices.

No. 1 Cock, to fit air chambers on our 2½ and 3 inch Hand Force, and 2, 2½, 2¾ and 3 inch House Force Pumps; also, air chambers on our Figs. 401, 402, 600, 699, 413, 629, 638, with threads cut for 1 inch hose coupling, . . $2.00

No. 2 Cock, to fit air chambers on our 3½ and 4 inch Hand Force, and 3¼ and 3½ inch House Force Pumps; also, air chambers on our Figs. 237 and 593, with threads cut for 1½ inch hose coupling, ... $2.50

ROD COUPLINGS.



We make them both of Brass and Malleable Iron, as ordered. They are used for connecting lengths of piston rod together in wells of any depth.

Malleable Rod Coupling, tapped for 7-16 or ⅜ inch rod, as shown in cut, .	25	cents.
Malleable Rod Coupling, with 7-16 inch stub ends, ...	40	cents.
Malleable Rod Coupling, with ½ inch stub ends with keys, ...	50	cents.
Rods and Couplings, ½ and 7-16 inch, per foot, ...	12½	cents.
Rods and Couplings, ⅜ inch, per foot, ...	16	cents.
Brass Rod Coupling, tapped for ⅜ inch rod, ...	25	cents.
Brass Rod Coupling, tapped for ⅝ inch rod, ...	45	cents.

Liberal discounts made from above lists.

GAS PIPE COUPLING, WITH GUIDE.

FIG. 771.

The annexed cut represents our new Pump Rod Guide to screw on pipe for deep well Pumps. It is intended for the rod to work through the Guide as shown in cut, which dispenses with the vibrations and noise heretofore made by rod working in pipe; and couplings are not so liable to work loose. It also prevents rods from cramping or breaking, which so often occur and becomes a source of annoyance. These couplings are screwed on each length of pipe.

Screwed for 1¼ in. pipe, each, . .	$0.75	Screwed for 2½ in. pipe, each, . .	$2.00
" 1½ " " . .	1.00	" 3 " " . .	2.75
" 2 " " . .	1.25		

DRIVE WELL FILTER POINTS.

FIG. 508.

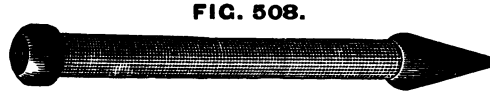


Fig. 508 is made of malleable iron, galvanized both inside and out, and covered with gauze protected with perforated tin. This Point has been on the market many years and always favorably received.

Sizes and Prices.

Fig. 508,	1¼	in. diameter,	24	in. long, with	48,	¾	in. holes,	$3.00
"	1½	"	29	" "	52,	⅞	"	4.75
"	2	"	36	" "	60,	1	"	8.00
"	2½	"	44	" "	60,	1⅛	"	12.00
"	3	"	53	" "	74,	1⅛	"	18.00

WASHER FILTER POINT.

FIG. 661.

Fig. 661 is a Washer Point; that is, the brass gauze is held in its place by brass washers, countersunk into the gas pipe instead of being soldered on to the pipe, as is common. It is made of galvanized gas pipe and has been largely used.

Sizes and Prices.

Fig. 661,	1¼	in. diameter,	25	in. long,	60	holes.	$2.50
"	1¼	"	28	"	80	"	3.00
"	1¼	"	40	"	120	"	4.50

DRIVE WELL FILTER POINTS.

FIG. 524.

Fig. 524 is the *favorite* Brass Jacket Drive Well Point in the market. It is made from galvanized pipe, drilled with 7-16 inch holes, and covered with gauze varying in grade from the ordinary, No. 50, to the finest, No. 90, while over this still is placed the perforated brass jacket to protect it. Wherever the soil will admit of it we always recommend the use of the coarser gauzes as giving the best effects. The table and prices given below will be found very complete and comprehensive.

FIG. 524. Sizes, Prices, Etc.

No.	Size of Pipe.	Length of Jacket.	Length of Pipe.	Number of Holes.	No. 50 Gauze.	No. 60 Gauze.	No. 80 Gauze.	No. 90 Gauze.
1	1¼ in.	14 in.	20 in.	60	$2.50	$2.75	$3.50	$4.00
2	1¼ "	18 "	24 "	80	3.00	3.25	4.00	4.50
3	1¼ "	24 "	30 "	100	3.75	4.00	5.25	5.75
4	1¼ "	30 "	36 "	120	4.50	5.00	6.50	7.25
5	1¼ "	36 "	42 "	160	5.50	6.00	7.50	8.25
6	1¼ "	42 "	48 "	180	6.00	6.50	8.50	9.25
7	1¼ "	48 "	54 "	200	6.75	7.25	9.50	10.75
8	1½ "	24 "	30 "	100	4.75	5.00	6.50	7.25
9	1½ "	30 "	36 "	140	5.50	6.00	7.50	8.25
10	1½ "	36 "	42 "	180	6.00	6.50	8.50	9.50
11	1½ "	42 "	48 "	200	6.50	7.00	9.00	10.00
12	1½ "	48 "	54 "	250	7.25	8.00	10.50	12.25
13	2 "	24 "	30 "	200	7.00	8.00	10.00	11.25
14	2 "	30 "	36 "	250	8.00	9.00	11.00	12.25
15	2 "	36 "	42 "	300	9.00	10.00	13.00	15.50
16	2 "	42 "	48 "	350	10.00	12.00	15.00	18.50
17	2 "	48 "	54 "	400	11.00	13.50	18.00	20.50

Larger sizes up to 6 inches made to order.

TUBULAR WELL FILTER POINTS.

WITH FLUSH HEADS.

FIG. 662.

Fig. 662 is the same in all respects as Fig. 524, given above, except it has a flush head and is designed for tubular wells. These points will go inside of 2 in. pipe.

Sizes, Prices, Etc.

No.	Size of Pipe.	Length of Jacket.	Length of Pipe.	Number of Holes.	No. 50 Gauze.	No. 60 Gauze.	No. 80 Gauze.	No. 90 Gauze.
18	1¼ in.	24 in.	30 in.	100	$4.25	$5.00	$6.25	$7.25
19	1¼ "	24 "	51 "	100	4.50	5.25	6.75	7.75
20	1¼ "	30 "	45 "	120	5.00	5.75	7.50	8.50
21	1¼ "	30 "	57 "	120	5.25	6.00	7.75	8.75
22	1¼ "	36 "	51 "	160	5.75	6.50	8.25	9.25
23	1¼ "	36 "	63 "	160	6.00	7.00	9.00	9.75
24	1¼ "	42 "	57 "	200	6.50	7.50	9.50	10.25
25	1¼ "	42 "	69 "	200	6.75	7.75	9.75	10.75

☞ In ordering, it is only necessary to give the "No." of point marked in first column at the left and number gauze desired; or, if preferred, like this: 1¼ x 18 x 24 x 80, No. 50, for an ordinary point.

PACKING BOX FOR FORCE PUMPS.

FIG. 707.

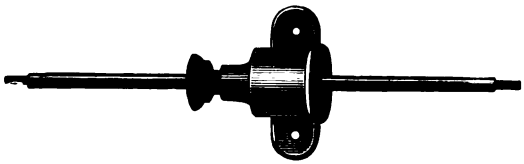


FIG. 707, Cut for either 1 in. or 1¼ in. pipes, . (Rive.) . . . $3.00
" " 1½ " " . (Vividly.) . . . 3.25
" " 2 " " . (Vividness.) . . . 3.50

MALLEABLE IRON DRIVING CAPS.

For receiving blows from wood maul, or block, when struck with iron sledge, for driving wells. Entirely new — our own design and pattern.

FIG. 510, Fitted for wrought-iron pipe, 1¼ inch, ... $0.72
" " " " " " 1½ " 90
" " " " " " 2 " 1.55
Steel Driving Cap, or Head, for 1¼ inch pipe, each, ... 3.00
" " " " " 1½ " " 4.50

SAND BUCKET OR PUMP.

FOR OPENING OUT DRIVEN WELLS. MADE WITH COPPER BARREL, BRASS FITTINGS AND BRASS VALVES.

Fitted for ½ inch gas pipe, for 1¼ inch Driven Well Point, net, . . . $2.50
" ½ " " " 1½ " " " " " . . . 3.50

PATENT IMPROVED CLAY AND SAND AUGERS.

FOR BORING WELLS.

CLAY AUGERS.				SAND AUGERS.			
2½ in., to couple on	1¼ in. pipe,	$6.00		2½ in., to couple on	1¼ in. pipe,	$7.50
3 " "	1¼ "	6.75		3 " "	1¼ "	8.50
4 " "	1½ "	10.50		4 " "	1½ "	13.25
6 " "	1½ to 2,	25.00		6 " "	1½ to 2,	30.00

We make also a Sand and Clay Auger combined, which we list at same size and price as Sand Augers.

GAS PIPE CLAMP.

FIG. 678.

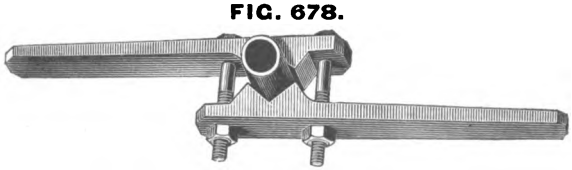


FIG. 678, as shown in cut, ... (Root.) $5.00

These Tools will be found to be very convenient for grappling Pipe, so as to hold it from above and prevent its getting away when putting up Pumps.

WIND MILLS AND WIND MILL PUMPS.

FOR IRRIGATION, WATERING STOCK, PLANTATIONS, ETC.

Wind Engines, or Wind Mills, with large cumbersome sails, taken off and put on by manual labor, involving considerable outlay for the purchase of one, have been in use in various parts of the world for centuries. But the modern device with automatic regulating arrangement is comparatively of recent development. In the United States there are probably scores of different kinds of mills manufactured, most of them possessing all the requisite features in various forms for a desirable machine.

We do not manufacture any species of Mill and are not interested in any of them in the most remote degree, and do not here propose to discuss the merits of *any* Mill, as we have no particular personal knowledge of any of them — but we do wish in a general way to state that we have faith in the system and principle of Wind Mills as now built and employed for operating pumps in lifting and forcing water for domestic purposes, watering stock, irrigation, etc. We think the time has come when, in foreign countries, Wind Mills will become as common as they are here in America, where their introduction has been so successful, and the demand for them is largely increasing.

We understand persons ordering them from a distance, or out of the country, can be furnished with complete measurements for the construction of the frame or derrick, as well as an idea of the best kinds of timber to use and the sizes of same, and full instructions how to put a Wind Mill up and in successful operation, so there can be no such thing as failure, no matter how inexperienced the purchaser may be. These Mills once put up require no particular attention. They are built to cope with the cyclone as well as the gentle breeze, and do not require the manipulation of an attendant to prepare them for the vicissitudes of the weather, but transform themselves into such a trim as to withstand the most severe hurricane. There is no room to doubt the above statement, for we have it from the most reliable sources, and do not hesitate to commend wind mills to our friends, for pumping water more particularly, and as some of the largest Mills have the capacity of producing from 15 to 20 horse-power, it will be seen that pumps of large proportions can be operated by them. Now, what can be better adapted to countries where a lack of irrigation is the only impediment to the most abundant and luxuriant growth of its products than a good Wind Mill and pump?

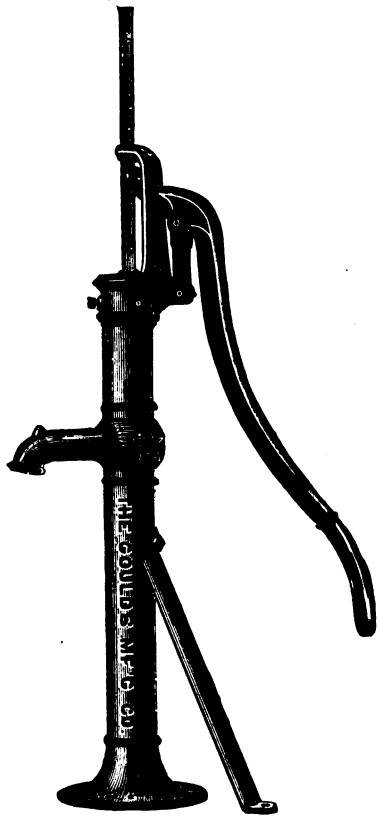
A 2 horse-power Mill will work a Pump lifting water about 15 feet, and running 25 revolutions per minute, give about 60 barrels of water per hour, or twelve hundred barrels every twenty-four hours. Larger Mills will afford comparatively larger quantities of power and work larger pumps with increased productive capacity. Wind Mills are also used extensively by railroad companies for pumping water at their stations for supplying locomotives; for grinding corn and feed and a variety of other purposes.

Should any of our correspondents abroad desire Wind Mills, we will exert ourselves to furnish any necessary information, and if need be purchase same for them, forwarding all the intelligence required to set up one and take care of it. All the woodwork for a Mill can be constructed on the ground where the Mill is to be erected, and thereby save the cost of transporting such bulky material. Each piece of the iron work is numbered, and by the aid of diagrams sent with each Mill, can be adjusted without confusion.

We build a large variety of pumps that can be used in connection with Wind Mills, and shall be pleased to answer any communication regarding Mills or Pumps.

NEW STAR, "1885," WIND MILL STANDARD.

FIG. 762.



The cut shows one of our new line of Well Pump Standards with Wind Mill Tops, consisting of three different sizes, and described as Nos. 3, 4, and 5, and of dimensions recited in table below. They contain all the advantages suggested by the most recent practice and will be found to be the best of the kind made by any manufacturer.

It is our intention to have this supersede entirely the different sizes of our Fig. 585, which has been before the trade so long, and has been so very popular.

The hood or cap casting of these Standards is made very deep so that the upper end of the Pump body with shoulder for sustaining the cap extends into it about 2½ inches, fitting it close enough to prevent any swaying; while three heavy steel set screws complete the junction and unite the two as firmly as though they were one casting. There are no gimcracks, rotating bushings, or other useless miniature parts about these Standards; everything is solid and substantial and calculated to give the best possible results. They are tapped for pipe near the spout, have supporting brace, and are a most suitable Standard everyway. We can fit the 6 in. or 10 in. stroke pumps for 1¼, 1½ or 2 in. pipe, as ordered, but always fit as below unless otherwise directed.

Those tapped for 2-inch pipe have connection for coupling on wooden rod.

We do not send Wind Mill Slides except when specially ordered.

FIG. 762. Sizes, Prices, Etc.

No.	6-IN. STROKE	10-IN. STROKE.	Flat Rod.	Height Base to Upper Guide.	6-INCH STROKE.		10-INCH STROKE.	
	Suction.	Suction.			Cipher.	Price.	Cipher.	Price.
3	1¼ in.	2 in.	1 x ⅜ in.	43 in.	Vaunter	$7.00		
4	1¼ "	2 "	1 x ½ "	45 "	Vauntful	7.50	Veader	$9.00
5	1¼ "	2 "	1 x ½ "	47 "	Vaunting	8.00	Veal	9.50

For Cylinders to go with this Standard see pages 48 to 54.

STAR WIND MILL PUMP STANDARD.

FOR DEEP WELLS.

FIG. 412.

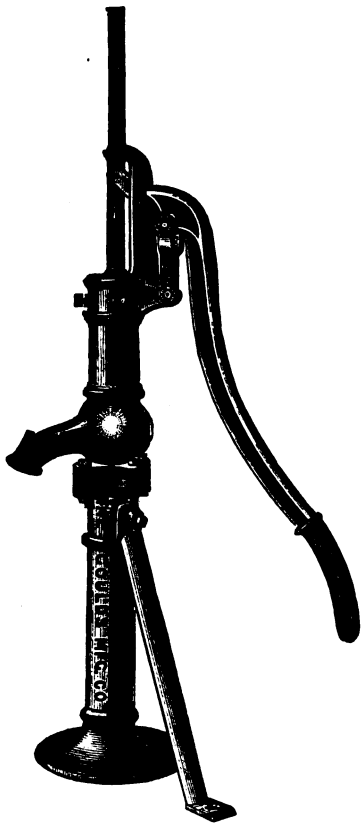


Fig. 412 is the same in all respects as our old Fig. 543, except the top, flat rod, and upper section of Pump Standard. This top or cap is made very deep, so that the upper end of Pump body with shoulder for sustaining the cap extends into it about 2½ inches, fitting it close enough to prevent any swaying; while three heavy steel set screws complete the junction and unite the two firmly together.

This top is identical with one used on and described under Fig. 762, page 64.

This Standard is in two sections, bolted together just below the spout. Between the two sections is interposed a flange, into which the connecting pipe is screwed. These flanges are all of a size, and drilled exactly alike, so that they will interchange, and can be screwed for either 1¼, 1½, 2 or 2½ inch wrought-iron pipe. By having an assortment of differently screwed flanges, the same Standard can be adapted for any one of above-mentioned sizes of pipe.

Always fitted as below unless otherwise directed.

We do not send Wind Mill Slides unless especially ordered.

FIG. 412. Sizes, Prices, Etc.

	Stroke.	Suction.	Flat Rod.	Height Base to Upper Guide.	Cipher.	Price.
Standard complete,	6 in.	1¼ in.	1 x ½ in.	44½ in.	Lain	$10.00
Standard complete,	10 "	2 "	1 x ½ "	48¼ "	Lair	11.50

EXTRA FLANGES,

For 1¼ inch, ... $0.50
For 1½, 2 or 2½ inch, ...60

See pages 48 to 54 for Cylinders to go with this Standard.

NEW ADJUSTABLE STROKE PUMP.

WITH WIND MILL TOP.

FIG. 733.

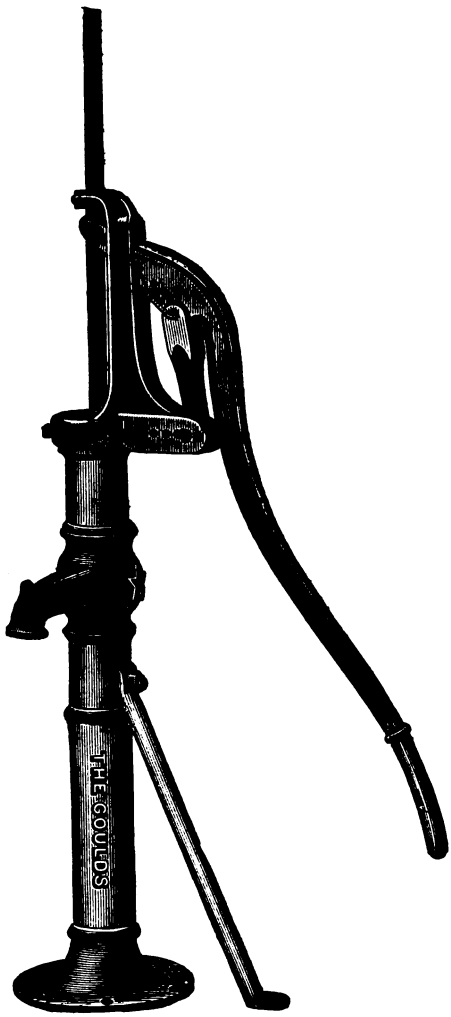


Fig. 733 represents our Adjustable Stroke Pump with Wind Mill Top, and is particularly adapted to all kinds of Drilled or Tubular Wells, and where working barrels are formed inside of two inch pipe.

This Pump can be changed to 6, 8, and 10 inch stroke to suit the length of Cylinder and amount of water required, and the Trade will find it a very convenient Pump to carry in stock, having three different strokes combined in one Pump.

The Pump is made strong and durable, the working top easily adjusted, and the stock is tapped inside the barrel immediately below the spout, for suction pipe.

Always fitted for 2 inch pipe, unless otherwise ordered—and if a Standard is wanted for larger than 2 inch pipe we can arrange our Fig. 412 with adjustable top at the extra list price.

Wind Mill Slides are not furnished unless especially ordered.

FIG. 733. Sizes, Prices, Etc.

	Stroke.	Suction.	Flat Rod.	Height Base to Upper Guide.	Cipher.	Price.
Standard complete,	6, 8 & 10 in.	2 in.	1 x 3/8 in.	49 in.	Tome	$10.00

For Cylinders to go with this Standard see pages 48 to 54.

HEAVY WIND MILL PUMP STANDARD.

FOR DEEP WELLS.

FIG. 764.

Fig. 764 represents one of our best known extra heavy Deep Well Pump Standards, arranged with Wind Mill Top. It is the strongest and best built Standard ever offered to the trade, and for Wind Mill use is admirably adapted for heavy and constant work. They are successfully used on wells from 100 to 300 feet deep.

Any size from 1¼ inch to 2½ inch pipe can be used with this Standard, but always fitted as below unless otherwise ordered.

Wind Mill Slides are not furnished unless especially ordered.

FIG. 764. Sizes, Prices, Etc.

	Stroke.	Suction.	Flat Rod.	Height Base to Upper Guide	Cipher.	Price.
Standard complete,	6 in.	1½ in.	1¼ x ½ in.	52½ in.	Valise	$17.00
Standard complete,	10 "	2 "	1¼ x ½ "	56½ "	Valley	18.50

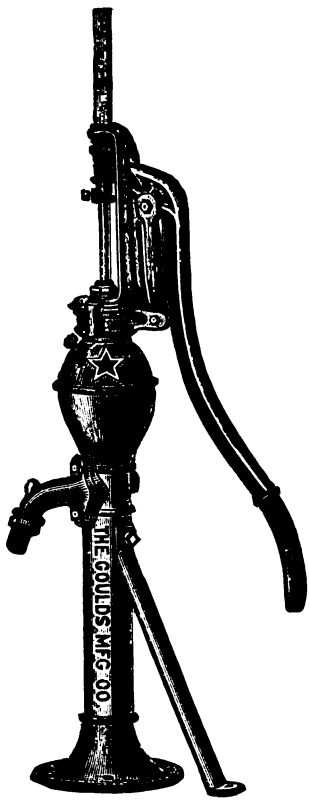
EXTRA FLANGES.

1¼ inch pipe, each, ... $0.50
1½, 2 and 2½ inch pipe, each, ...60

For Cylinders to go with this Standard, see lists given on pages 48 to 54.

NEW STAR, "1885," WIND MILL FORCE PUMP STANDARD.

FIG. 422.



We make two sizes, Nos. 1 and 2, of the New Star Force Pump Standards with Wind Mill Tops, as shown by the cut, of dimensions stated below. Our method of fastening the top to the body is peculiar, but most effective; we bore out the top and turn off the body from the shoulder up, to established sizes, so that they fit each other perfectly. Two strong hook bolts pass down through the top and catch into a groove made in the body to receive them, holding the two unyieldingly together by screwing down the nuts; while by releasing the pressure on the hooks, by unscrewing the nuts, the top can be revolved to any desired position.

To secure perfect alignment of rod bearings, we slip the top castings on to a flat rod fastened to face plate of lathe the size of guide opening and with that as a center bore out inside of top and the stuffing box in same with one chucking.

Where stuffing box is in the body, instead of the top, there *must* be more or less friction, as the bearings are not in line from their very manner of construction, and cannot be made so without great trouble.

We also avoid superfluous appendages in the shape of useless supplementary guides, aiming to have as few parts as necessary—and those adequately strong. This applies to all pumps we build with Wind Mill Tops.

All these Standards when sold as such are tapped for pipe near the spout. Each one has an outlet back of the spout for attaching pipe, and the spout is provided with hose tube to screw on, and not with a clap-trap of a clamp.

Always tapped as below unless otherwise ordered. Wind Mill Slides are not sent unless especially ordered.

FIG. 422. Sizes, Prices, Etc.

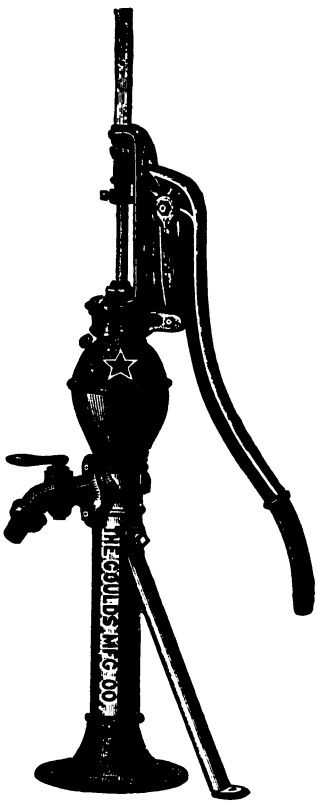
No.	6-IN. STROKE	10-IN. STROKE.	Flat Rod.	Height Base to Upper Guide.	6-INCH STROKE.		10-INCH STROKE.	
	Suction.	Suction.			Cipher.	Price.	Cipher.	Price.
1	1¼ in.	2 in.	1 x ½ in.	47 in.	Vehement.	$10.00	Vehicled	$11.50
2	1¼ "	2 "	1 x ½ "	50 "	Vehicle.	11.00	Veil.	12.50

For Cylinders to use with this Standard see pages 48 to 54.

NEW STAR, "1885," WIND MILL FORCE PUMP STANDARD.

WITH COCK.

FIG. 423.



This is the same Force Pump Standard in all respects as our Fig. 422, more fully described on the opposite page, except that it has a Cock Spout. When Pipe is connected to the side opening behind the Spout, there must be some means for closing the spout opening, and a Cock does this. In this manner the water may be distributed in two or more directions, the same as with a three-way Cock Pump. Thus, one Pump may be made to supply water at the house or any part of the premises as well as at the point of operations, while the cost has been reduced to a minimum for a Pump of this kind. The nose of Cock is screwed for 1¼ in. Gas Pipe Thread, and will take 1 in. hose coupling.

The Standards are always tapped as below, unless otherwise ordered. Wind Mill Slides are not sent unless especially ordered.

FIG. 423. Sizes, Prices, Etc.

No.	6-IN. STROKE	10-IN. STROKE.	Flat Rod.	Height Base to Upper Guide.	6-INCH STROKE.		10-INCH STROKE.	
	Suction.	Suction.			Cipher.	Price.	Cipher.	Price.
1	1¼ in.	2 in.	1 x ½ in.	47 in.	Vein	~~$12.50~~ $12.00	Veinless	~~$14.00~~ $13.50
2	1¼ "	2 "	1 x ½ "	50 "	Veined	13.50	Veinly	15.00

For Cylinders to use with this Standard see pages 48 to 54.

STAR WIND MILL FORCE PUMP STANDARD.

WITH BRACE.

FIG. 401.

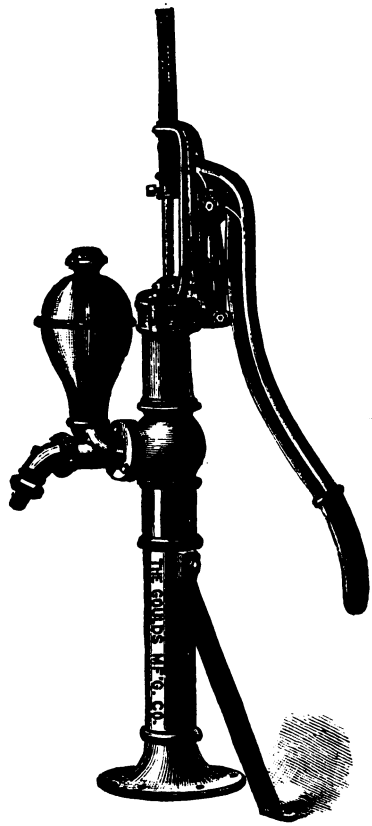


Fig. 401 is the same in all respects as our old Fig. 580, excepting the top, flat rod, and, of necessity, the Standard. The top is of a new and improved design, having a deeper cap, thus giving a longer and firmer bearing on the Standard.

Two strong hook bolts pass down through this top and catch into a groove made in the Standard to receive them, thus holding the two firmly together by screwing down the nuts.

The flat rod is made from 1 x ½ inch flat iron, instead of 1 x ⅜, as heretofore.

For a fuller description of this top see our Fig. 422, page 68, as these parts are identical.

The gas pipe is connected in the body, close under the spout, and either 1, 1¼, 1½ or 2 inch can be used if so ordered, but always fitted as below unless otherwise directed. We *cannot* fit this Standard for 2½ inch pipes. When wanted with suction for this size of pipe, see Fig. 402, on opposite page.

On the extremity of spout we place a coupling and tube for 1 inch hose. We build these Standards for 6 and 10 inches stroke.

Wind Mill Slides are not furnished unless especially ordered.

FIG. 401. Sizes, Prices, Etc.

	Stroke.	Suction.	Flat Rod.	Height Base to Upper Guide.	Cipher.	Price.
Standard complete,	6 in.	1¼ in.	1 x ½ in.	48 in.	Meat	$13.00
Standard complete,	10 "	2 "	1 x ½ "	52 "	Meek	14.50

See pages 48 to 54 for Cylinders to go with this Standard.

STAR WIND MILL FORCE PUMP STANDARD.

WITH FLANGED STOCK AND BRACE.

FIG. 402.

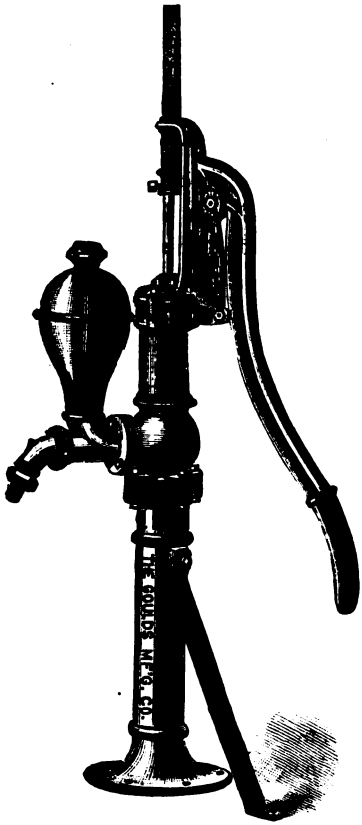


Fig. 402 is the same in all respects as our old Fig. 594, excepting the top, flat rod, and, of necessity, the upper section of Standard. The top is of a new and improved design, having a deeper cap, thus giving a longer and firmer bearing on the Standard.

Two strong hook bolts pass down through this top and catch into a groove made in the Standard to receive them, thus holding the two firmly together by screwing down the nuts.

The flat rod is made from 1 x ½ inch flat iron instead of 1 x ⅜, as heretofore.

For a fuller description of this top see our Fig. 422, page 68, as these parts are identical.

This Standard is built in two sections, same as Fig. 412; in fact, like Figs. 236 and 237, as we have been led to adopt this method of construction from the great popularity of the latter. No Pumps have ever given the satisfaction that these have, and we hope Fig. 402 and its kindred styles of Pumps will take as well.

The intermediate flange can be screwed for any size of Pipe up to and including 2½ inch, but always shipped as below unless otherwise ordered. The Coupling and Tube at the Spout is fitted for 1 inch hose.

Wind Mill Slides are not furnished unless especially ordered.

FIG. 402. Sizes, Prices, Etc.

	Stroke.	Suction.	Flat Rod.	Height, Base to Upper Guide	Cipher.	Price.
Standard complete,	6 in.	1¼ in.	1 x ½ in.	48½ in.	Mine	$13.50
Standard complete,	10 "	2 "	1 x ½ "	52½ "	Mint	15.00

We add $2.50 to list when Cocks are sent.

EXTRA FLANGES.

1¼ inch, each, ... $0.50
1½, 2 and 2½ inch, each, ...60

See pages 48 to 54 for Cylinders to go with this Standard.

"SOUTHERN" WIND MILL FORCE PUMP STANDARD.

WITH COCK.

FIG. 413.

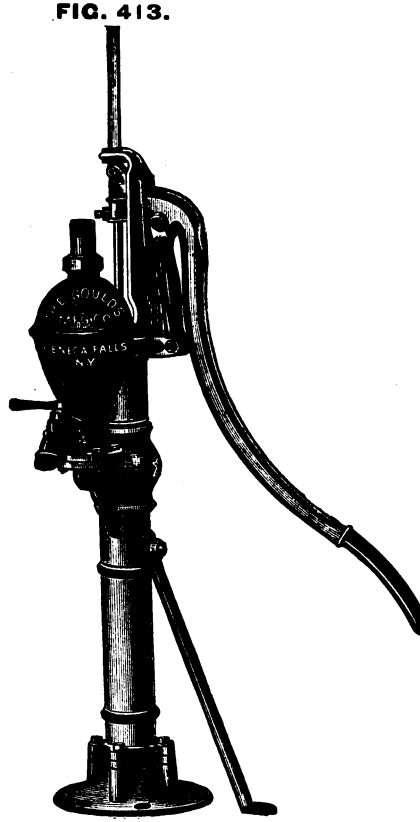


Fig. 413 is the same in all respects as our old Fig. 669, excepting the top, flat rod, and, of necessity, the Standard.

Two strong hook bolts pass down through this top and catch into a groove made in the Standard to receive them, thus holding the two firmly together, by screwing down the nuts.

The flat rod is made from 1 x ½ inch flat iron, instead of 1 x ⅜, as heretofore.

For a fuller description of this top see our Fig. 422, page 68, as these parts are identical.

This Wind Mill Force Pump Standard has the intervening flange inserted just above the base. There is a check valve underneath the air chamber, so that these Standards are only adapted to warm climates.

The flanges can be screwed for any size of pipe up to and including 2½ inch. The upper discharge of air chamber is always fitted for 1¼ or 1½ inch pipe as ordered, and the nose of the cock for 1 inch hose.

Wind Mill Slides are not furnished unless especially ordered. Fitted as below unless otherwise directed.

FIG. 413. Sizes, Prices, Etc.

	Stroke.	Suction.	Flat Rod.	Height Base to Upper Guide.	Cipher.	Price.
Standard complete,	6 in.	1¼ in.	1 x ½ in.	49½ in.	Road	$15.50
Standard complete,	10 "	2 "	1 x ½ "	53½ "	Roan	17.00

For Cylinders to go with this Standard see pages 48 to 54.

HEAVY WIND MILL FORCE PUMP STANDARD.

FOR DEEP WELLS.

FIG. 765.

Fig. 765 represents our New Wind Mill Deep Well Force Pump Standard of extra heavy pattern, and constructed in two sections with flange between. This last feature is considered a very great advantage by all who put up these pumps, for by a change of flanges they can readily be fitted for any size from 1¼ to 2½ inch gas pipe, thus readily adapting them for every need. Always fitted as below unless otherwise ordered.

The coupling and tube at the discharge is fitted for 1 inch hose.

Wind Mill Slides are not sent unless especially ordered.

FIG. 765. Sizes, Prices, Etc.

	Stroke.	Suction.	Flat Rod.	Height Base to Upper Guide.	Cipher.	Price.
Standard complete,	6 in.	1½ in.	1¼ x ½ in.	52½ in.	Vallum	$21.00
Standard complete,	10 "	2 "	1¼ x ½ "	56½ "	Valor	22.50

When ordered with a cock in the spout we add $2.50 to the list.

EXTRA FLANGES.

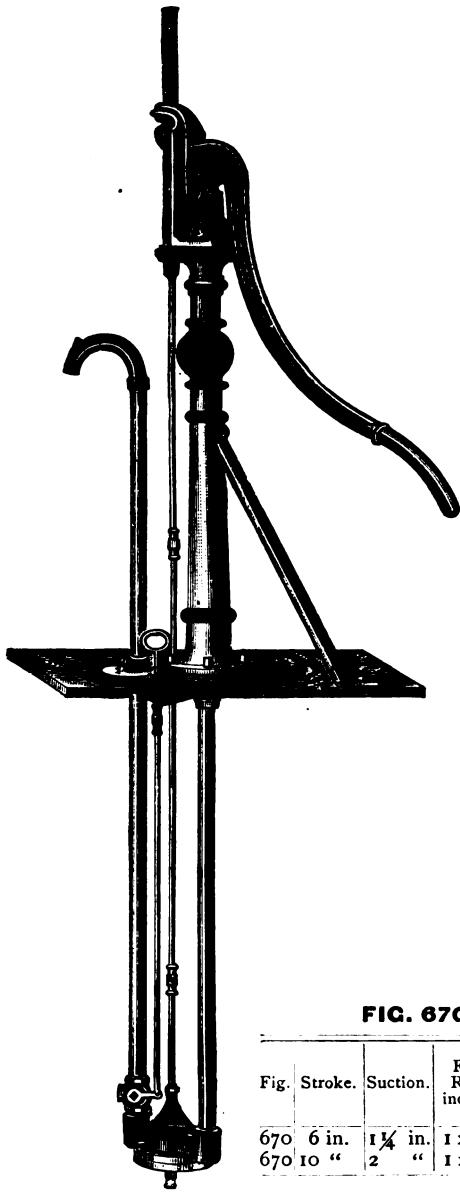
1¼ inch pipe, each, ... $0.50
1½, 2, and 2½ inch pipe, each, ...60

For Cylinders to go with this Standard see pages 48 to 54.

ANTI-FREEZING WIND MILL FORCE PUMP.

WITH THREE-WAY COCK.

FIG. 670.



The cut shows our Anti-Freezing Wind Mill Force Pump, with three-way Cock, Shifting Rod, Goose Neck Spout and Air Chamber. This Standard is very heavy, and stiffened by the oblong shape of base as well as by a supporting brace. The stuffing box is over four feet below the platform and beyond the influence of frost; the rod connecting the piston to the end of the lever is of half inch iron and has four bearings in its length; the air is compressed in the pipe running parallel with the connecting pipe, hence it has a large amount of surface, and produces a very uniform and even pressure on the column of water. These Pumps are built with special tools, and all parts will interchange. For shipping, we usually separate Standard from the base and lower part for convenience of handling.

A Cylinder can be located at any desired distance below the working head. Always fitted for sizes pipe as given below unless otherwise ordered. A coupling and tube is placed on the spout fitted for ¼ inch hose.

Wind Mill Slides are not sent unless especially ordered.

FIG. 670. Sizes, Prices, Etc.

Fig.	Stroke.	Suction.	Flat Rod, inches.	Height Base to Upper Guide.	Length Base to Bottom Flange.	Cipher.	Price.
670	6 in.	1¼ in.	1 x ⅜	46 in.	51 in.	Roar	$16.00
670	10 "	2 "	1 x ⅜	50 "	51 "	Roast	17.50

When ordered without the Three-Way Cock deduct $2.00 from list.

See pages 48 to 54 for Cylinders to use with this Standard.

ANTI-FREEZING WIND MILL FORCE PUMP.

WITH PATENT VERTICAL DISTRIBUTING VALVE AND BRASS ELBOW ATTACHMENT.

FIG. 736.

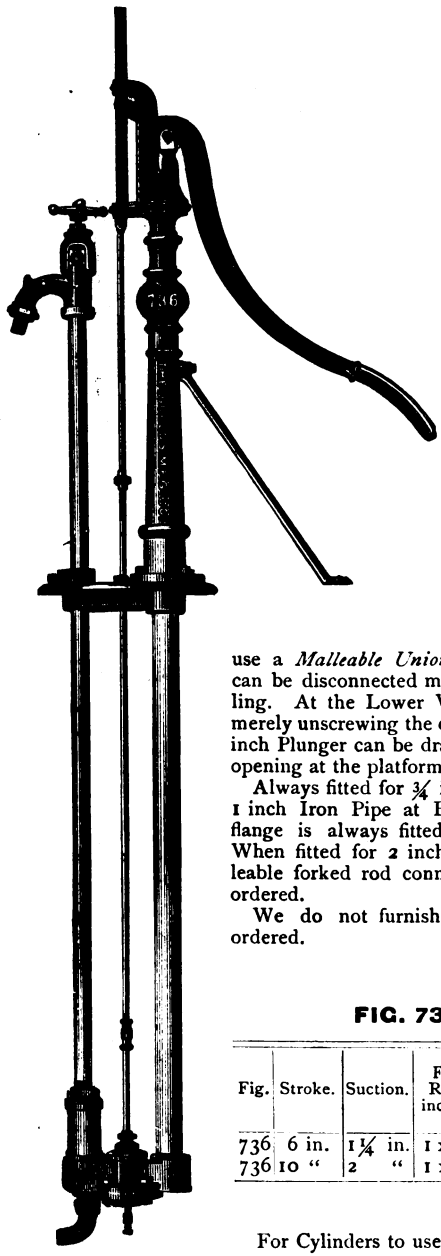


Fig. 736 represents our Anti-Freezing Wind Mill Force Pump with Vertical Distributing Valve, and Brass Elbow attachment at the Bottom outlet. We use 1¼ inch Iron Pipe for the discharge, which is made in one piece and held in place with a set screw at the platform base, so that by merely unscrewing the coupling below and loosening the set screw at the base, the pipe can be pulled up and the valve and working parts examined and repaired. We use 2 inch Iron Pipe for the Air Chamber, which is done to strengthen the set length and keep the working parts in perfect line with each other. At the bottom outlet we use a Brass Elbow Union Attachment, which is more convenient in making the regular pipe connections than any other way. We use a regular Brass Stuffing Box above the spout, which prevents all leakage when hose is connected. The valve is opened and closed by turning the wheel above the Stuffing Box, as shown in cut. The opening through the platform is made larger, and pipe can pass through without taking off the Standard. We also use a *Malleable Union Coupling*, for the plunger rod, which can be disconnected much easier than with the ordinary coupling. At the Lower Working Head it is so arranged, that by merely unscrewing the cap or attachment on top, a 2 inch or 2½ inch Plunger can be drawn through and so on up through the opening at the platform base.

Always fitted for ¾ inch Hose Coupling at the spout and for 1 inch Iron Pipe at Brass Elbow Attachment. The bottom flange is always fitted as below unless otherwise ordered. When fitted for 2 inch suction pipe we always furnish a malleable forked rod connection for Wood Rod unless otherwise ordered.

We do not furnish Wind Mill Slides unless especially ordered.

FIG. 736. Sizes, Prices, Etc.

Fig.	Stroke.	Suction.	Flat Rod, inches.	Height Base to Upper Guide.	Length Base to Bottom Flange.	Cipher.	Price.
736	6 in.	1¼ in.	1 x ½	46 in.	58 in.	Tolsey	$18.00
736	10 "	2 "	1 x ½	50 "	58 "	Tombac	19.50

For Cylinders to use with this Standard see pages 48 to 54.

WIND MILL WORKING HEADS.

FIG. 685.

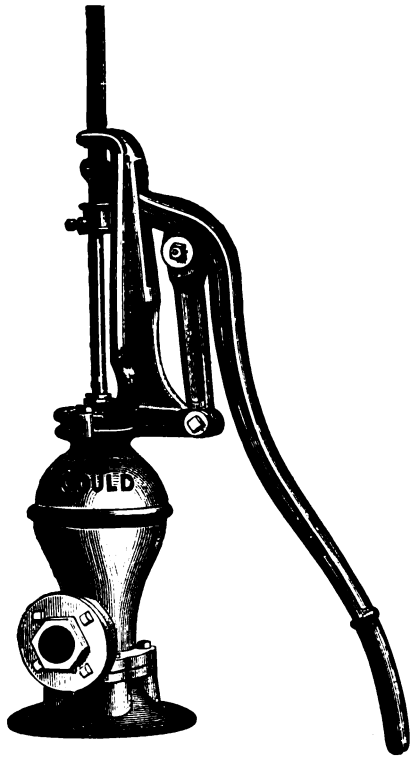


FIG. 686.

Figs. 685 and 686 are the same, in all respects, as our old Figs. 701 and 737, excepting the Top, Flat Rod, and, of necessity, the upper end of the Working Heads. The Top is of a new and improved design, having a deeper Cap, thus giving a longer and firmer bearing on the Working Head.

Two strong hook-bolts pass down through this top and catch into a groove made in the Head to receive them, thus holding the two firmly together by screwing down the nuts.

The Flat Rod is made from 1 x ½ inch flat iron, instead of 1 x ⅜, as heretofore.

For a fuller description of this Top see our Fig. 422, page 68, as these parts are identical.

They are our new Working Heads, to be used in connection with wind mill, or for hand or power use.

Between the air chamber and the base is inserted a flange, which can be fitted for either 1, 1¼, 1½, 2 or 2½ inch suction pipe, as ordered. Please advise what size suction and discharge you wish to use, for we always fit them, both suction and discharge, for 1¼ inch pipe unless otherwise ordered.

We can put on a forked rod for attaching to wood rod of wind mill, if so ordered, at our usual extra price for same. Wind Mill Slides are not furnished unless especially ordered.

Sizes, Prices, Etc.

Fig	Suction and Discharge.	Flat Rod.	Height Base to Upper Guide.		6-INCH STROKE.		10-INCH STROKE.	
			6-inch Stroke.	10-in. Stroke.	Cipher.	Price.	Cipher.	Price.
685	1¼ in.	1 x ½ in.	33 in.	37 in.	Sash.	$13.00	Sate.	$14.50
686	1¼ "	1 x ½ "	33 "	37 "	Toll.	15.00	Toller.	16.50

See pages 48 to 54 for Cylinders to be used with these Heads.

WIND MILL WORKING HEADS.

FIG. 689.

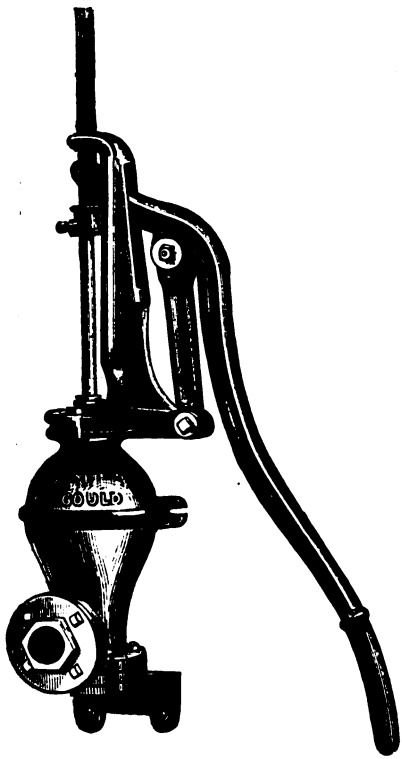
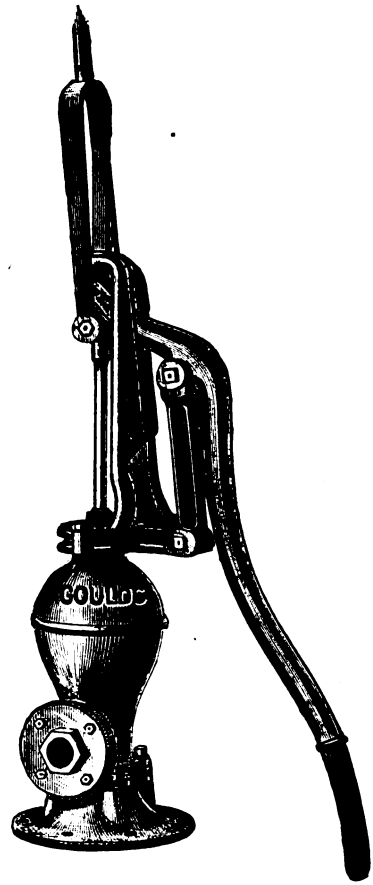


FIG. 690.



Figs. 689 and 690 are the same in all respects as our old Figs. 734 and 702, excepting the top, flat rod, and, of necessity, the upper end of the working head. The top is of a new and improved design, having a deeper cap, thus giving a longer and firmer bearing on the working head.

Two strong hook bolts pass down through this top and catch into a groove made in the head to receive them, thus holding the two firmly together by screwing down the nuts.

The flat rod is made from 1 x ½ inch flat iron, instead of 1 x ⅜, as heretofore.

For a fuller description of this top see our Fig. 422, page 68, as these parts are identical.

They represent still further modifications of our working heads to be used in connection with wind mills or for hand use. Between the air chamber and the lower section is inserted a flange, which can be fitted for either 1, 1¼, 1½, 2 or 2½ inch suction pipe, as ordered. Please advise what size suction and discharge you wish to use, for we always fit them, both suction and discharge, for 1¼ inch pipe unless otherwise ordered.

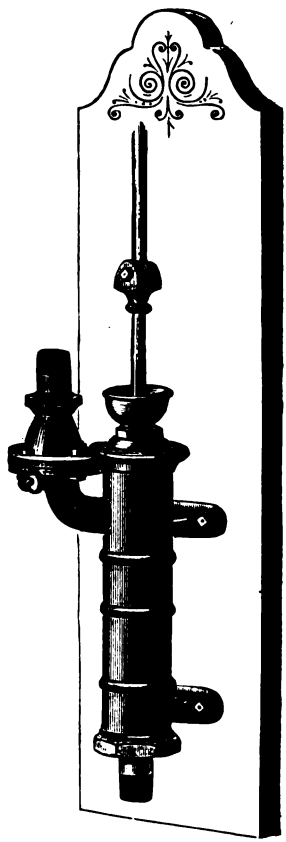
Sizes, Prices, Etc.

Fig.	Suc. and Dis.	Flat Rod.	Height Base to Upper Guide.		6-IN. STROKE.		10-IN. STROKE.	
			6-in. stroke.	10-in. stroke.	Cipher.	Price.	Cipher.	Price.
689	1¼ in.	1 x ½ in.	30 in.	34 in.	Tole	$13.00	Toled	$14.50
690	1¼ "	1 x ½ "	33 "	37 "	Top	17.00	Topman	18.50

Any of our Cylinders given on pages 48 to 54 can be used with these heads.

WIND MILL FORCE PUMPS.

FIG. 265.



Forked Rod.

These Pumps are used very extensively all over the country in connection with Wind Mills or Wind Engines, as they are frequently termed. They should be placed within twenty or twenty-five feet of the water. The shorter the suction pipe on any pump can be, the easier it will work and the longer it will last, and be less liable to get out of order. We show illustrations of other Pumps we build for this purpose on the following pages. Fitted for wrought-iron pipe unless otherwise ordered.

FIG. 266.

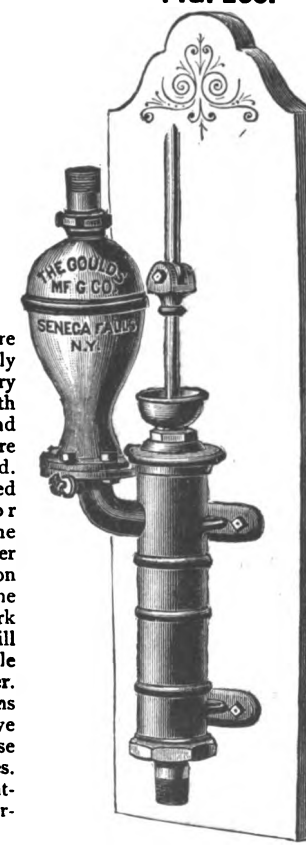


FIG. 265. Sizes, Prices, Etc.

No.	Diam. Cyl.	Suction and Discharge.	Stroke.	Capacity per Stroke.	IRON.		BRASS.	
					Cipher.	Price.	Cipher.	Price.
0	2 in.	1 in.	7 in.	1-10 gal.	Clasp	$7.50	Clay	$19.00
2	2½ "	1¼ "	7 "	1-7 "	Class	9.00	Clean	20.00
4	3 "	1¼ "	7 "	1-5 "	Claw	10.50	Clear	25.00
6	3½ "	1½ "	7 "	3-10 "	Voice	16.00	Void	30.00
8	4 "	2 "	7 "	3-8 "	Voiced	18.00	Voidable	40.00

FIG. 266. Sizes, Prices, Etc.

No.	Diam. Cyl.	Suction and Discharge.	Stroke.	Capacity per Stroke.	IRON.		BRASS.	
					Cipher.	Price.	Cipher.	Price.
0	2 in.	1 in.	7 in.	1-10 gal.	Clew	$10.00	Cling	$21.00
2	2½ "	1¼ "	7 "	1-7 "	Cliff	11.00	Clip	22.00
4	3 "	1¼ "	7 "	1-5 "	Climb	12.50	Clock	27.00
6	3½ "	1½ "	7 "	3-10 "	Climber	19.00	Cloak	33.00
8	4 "	2 "	7 "	3-8 "	Climbing	21.00	Clong	43.00

When arranged with forked or crotched rod, as shown above, to connect with wood rod of Wind Mill, add $1.50 to list.

WIND MILL PUMPS.

FIG. 447.

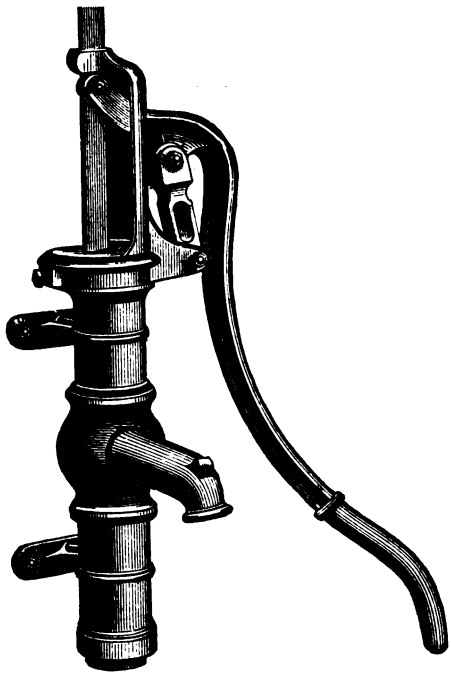


FIG. 448.

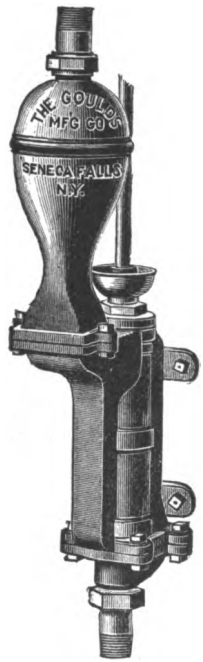


Fig. 447 shows our new Wind Mill Head, for use in connection with either a single or double acting Cylinder. The cut, with a trifling explanation, will readily manifest its merits, and as the device originated with a wind mill man, we feel we are offering to the trade an article that is calculated to meet the wants of this business in the fullest degree. The piston rod, made of flat iron, plays up and down through an aperture in the fulcrum which acts as a guide, and also through the lever provided with a slot in the upper end, when the engine or mill is in operation. When there is no wind to propel the mill, the piston rod is secured to the lever by a bolt, and the working of the Pump can be continued by hand, if necessary, without further trouble. A gas pipe thread is cut in the bottom attachment to join the Cylinder to the Standard.

Fig. 448 shows a Double Acting Force Pump, with brackets, by many preferred for use with Wind Mills. The piston rod can be made with a stub end to *weld* on an additional rod or with a malleable coupling for *screwing* on the rod. The smaller sizes are preferably employed on account of the small degree of power requisite, while the quantity of water obtained is equal to the capacity of a single acting Cylinder of much greater size.

Size and Price.

FIG. 447, Wind Mill Head, for 1 or 1¼ in. pipe, . (Fowl), . $5.50

FIG. 448. Sizes, Prices, Etc.

No.	Dia. Cyl.	Suction.	Discharge.	Stroke.	Capacity per Stroke.	IRON.		BRASS.	
						Cipher.	Price.	Cipher.	Price.
0	2 in.	1¼ in.	1¼ in.	7 in.	1-5 gal.	Fox	$12.00	Fred	$25.00
1	2¼ "	1¼ "	1¼ "	7 "	1-4 "	Frail	12.50	Free	26.00
2	2½ "	1¼ "	1¼ "	7 "	2-7 "	Frame	15.50	Fresh	35.00
3	2¾ "	1¼ "	1¼ "	7 "	1-3 "	Frank	17.00	Fret	42.00
4	3 "	1½ "	1¼ "	7 "	2-5 "	Fray	19.00	Friar	60.00

"PACIFIC" FORCE PUMP ON BASE.

FOR HAND OR WIND MILL USE.

FIG. 674.

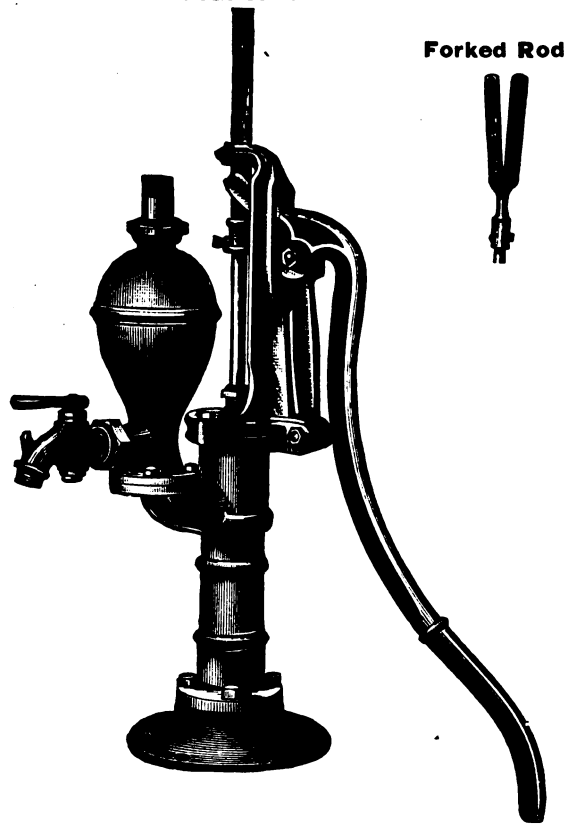


Fig. 674 represents our "Pacific" Force Pump on base for hand or wind mill use. The Pumps have been upon the market for some years, and are preferred above all others in certain localities. They are made in the very best manner, and combine strength with graceful proportions. All are made with brass cased rods, brass stuffing box, and provided with iron cocks with brass plugs.

The height of Pump from base to upper guide is from 30 to 35 inches and the weight from 80 to 130 pounds, according to size.

We build this Pump of iron, or with cylinder and piston of brass, or entirely of brass, except the lever, bearer, and air chamber, as per description given below.

FIG. 674. Sizes, Prices, Etc.

No.	Dia. Cyl.	Suction and Disch.	Stroke.	Capacity per Stroke.	IRON.		BRASS CYLINDER.		BRASS.	
					Cipher.	Price.	Cipher.	Price.	Cipher.	Price.
2	2½ in.	1¼ in.	6½ in.	1-7 gal.	Robe	$14.50	Robin	$20.00	Rock	$25.50
4	3 "	1¼ "	6½ "	1-5 "	Rod	16.50	Roe	21.50	Roil	37.50
6	3½ "	1½ "	6½ "	1-4 "	Roll	24.00	Romp	32.00	Rood	46.00
8	4 "	2 "	6½ "	1-3 "	Roof	25.50	Rook	38.50	Room	55.50

When arranged with forked or crotched rod, as shown above, *instead of* the lever and bearer to connect to wood rod of Wind Mill, no extra charge.

"PACIFIC" FORCE PUMP WITH BRACKETS.

FOR HAND OR WIND MILL USE.

FIG. 601.

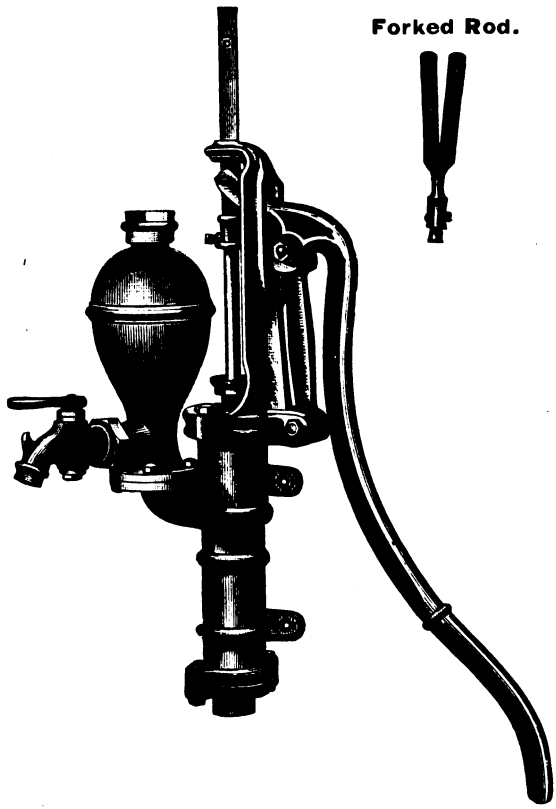


Fig. 601 represents our "Pacific" Force Pump with brackets for hand or Wind Mill use. It is a strong and efficient Pump, having a brass cased rod, brass stuffing box, and built in a most thorough and substantial manner. The height of Pump from base to upper guide is from 30 to 35 inches, and weight from 80 to 125 lbs., according to size.

We build this style of Pump of iron, or with Cylinder and Piston of brass, or entirely of brass except the lever, bearer, and air chamber, while all are provided with an iron cock with brass plugs, unless ordered otherwise.

FIG. 601. Sizes, Prices, Etc.

No.	Diameter Cylinder.	Suction and Dis.	Stroke.	Capacity per Stroke.	IRON.		BRASS CYLINDER.		BRASS.	
					Cipher.	Price.	Cipher.	Price.	Cipher.	Price.
2	2½ in.	1¼ in.	6½ in.	1-7 gal.	Life	$14.50	Lift	$20.00	Light	$25.50
4	3 "	1¼ "	6½ "	1-5 "	Limb	16.50	Lime	21.50	Limp	37.50
6	3½ "	1½ "	6½ "	1-4 "	Line	24.00	Link	32.00	Lint	46.00
8	4 "	2 "	6½ "	1-3 "	Lion	25.50	Lisp	38.50	List	55.50

When arranged with forked rod, as shown above, *instead of* the lever and bearer to connect to wood rod of Wind Mill, no extra charge.

"PACIFIC" DOUBLE ACTING FORCE PUMP.

FOR WIND MILL, HOUSE USE, ETC., ETC.

FIG. 638.

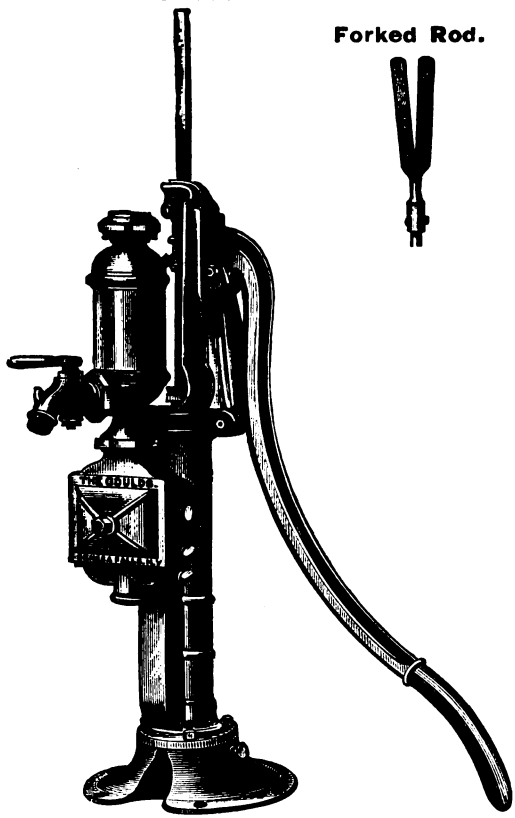


Fig. 638 represents our Pacific Double Acting Force Pump on base, which can be connected to Wind Mill or operated by hand power, as occasion requires. The valves are all under one plate in front of Pump, which is secured by only one nut, so that in case of repairs being needed, they can be gotten at easily without disturbing the suction pipe. Plugs for emptying the Pump of water in cold weather are provided, as shown in the cut.

FIG. 638. Sizes, Prices, Etc.

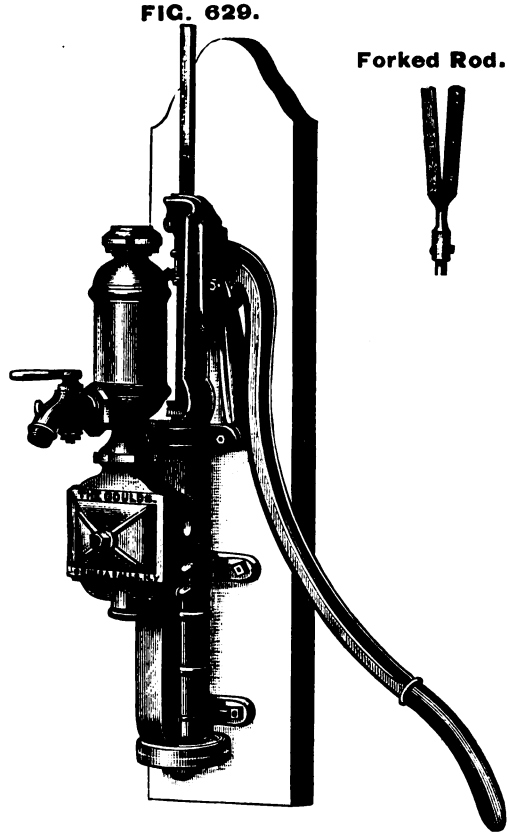
No.	Diameter Cylinder.	Suction and Discharge.	Stroke.	Capacity per Stroke.	Height Base to Upper Guide.	IRON.		BRASS LINED.	
						Cipher.	Price.	Cipher.	Price.
2	2½ in.	1¼ in.	6 in.	1-4 gal.	35 in.	Racy	$22.50	Rage	$27.50
4	3 "	1½ "	6 "	1-3 "	35 "	Raft	25.00	Rail	31.00

We deduct $1.50 from list when an iron union with brass coupling is supplied instead of the cock; and $3.50 where both cock and air chamber are not furnished. Nose of cock screwed for 1 inch hose coupling. When arranged with crotched or forked rod, instead of the lever and bearer, to connect to wood rod of Wind Mill, no extra charge.

"PACIFIC" DOUBLE ACTING FORCE PUMP.

FOR WIND MILL, HOUSE USE, ETC., ETC.

FIG. 629.



This cut shows a new and improved Double Acting Force Pump, which can be connected to Wind Mill, or operated by hand power, as occasion requires. Its construction is such that it can be used in the house, same as any Force Pump, and worked right or left handed by shifting the fulcrum to opposite side of plank. The valves are all under one plate in front, which is secured by only one nut. The connecting pipes do not have to be disturbed should the valves get choked up from any cause, while the valves are of a simple and durable structure.

Plugs for emptying the Pump of water in cold weather are provided as shown in the cut.

FIG. 629. Sizes, Prices, Etc.

No.	Diameter Cylinder.	Suction and Discharge.	Stroke.	Capacity per Stroke.	H'gt Base to Upper Guide.	IRON.		BRASS LINED.	
						Cipher.	Price	Cipher.	Price
2	2½ in.	1¼ in.	6 in.	¼ gal.	34½ in.	Quota	$22.50	Quoth	$27.50
4	3 "	1½ "	6 "	⅓ "	34½ "	Quote	25.00	Rabid	31.00

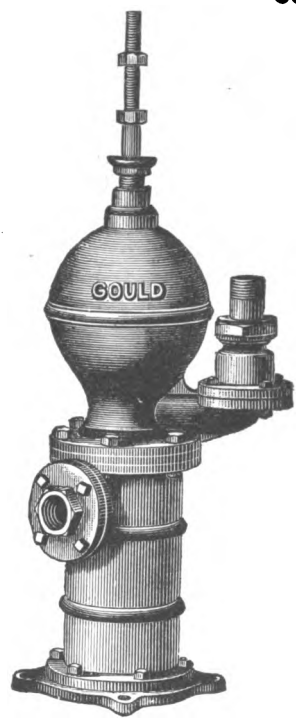
We deduct $1.50 from list when an iron union with brass coupling is supplied instead of the cock; and $3.50 where both cock and air chamber are not furnished. Nose of cock screwed for 1 inch hose coupling. When arranged with forked or crotched rod, instead of the lever and bearer, to connect to wood rod of Wind Mill, no extra charge.

NEW "SYPHON" WORKING BARREL.

FOR DEEP OR SHALLOW WELLS.

Forked Rod.

FIG. 514.



Harp Connection.

This cut shows our Syphon Self Priming Working Barrel for deep or shallow wells. The water enters through the suction opening, located above both the upper and lower valves, into the reservoir, or outer Cylinder, filling it with water to that point, and below which the water cannot recede. Into this body of water the inner Cylinder, provided with brass plunger, etc., is suspended, leaving suitable space between inner and outer walls and at bottom, the effect of which is, the pump is always primed, and ready for instant action; the valves are always under water and wet and not liable to decay.

It is very important that the inner Cylinder should be rigidly secured in its place, and to accomplish this we cast the barrel and flange in one piece, and interpose it between the air chamber and reservoir barrel flanges, bolting the three together firmly, as shown, making it a device that will successfully resist the jerking and heaving caused by the varying speed of a Wind Mill.

We have reduced the construction of this Cylinder to perfection, and can pronounce it mechanical in all respects, and adapted to the purpose for which it is used. Below we give sizes and prices.

FIG. 514. Sizes, Prices, Etc.

Diameter Inner Cylinder.	Suction and Discharge.	Stroke.	Capacity per Stroke.	BRASS INNER CYLINDER.	
				Cipher.	Price.
2½ inch.	1½ inch.	8½ inch.	1-6 gallon.	Hewn	$25.00
3 "	1½ "	8½ "	1-4 "	Hid	25.25
3½ "	2 "	8½ "	1-3 "	Hide	27.25
4 "	2 "	8½ "	2-5 "	High	30.50
4 "	2 "	10 "	1-2 "	Variate	40.00
4½ "	2½ "	10 "	2-3 "	Varicose	45.00
5 "	2½ "	10 "	7-8 "	Varied	50.00
5½ "	3 "	10 "	1 "	Variety	56.00
6 "	3 "	10 "	1 1-5 "	Varify	64.00
4½ "	2½ "	12 "	4-5 "	Various	54.00
5 "	2½ "	12 "	1 "	Varlet	60.00
5½ "	3 "	12 "	1 1-4 "	Varnish	66.00
6 "	3 "	12 "	1 1-2 "	Varry	78.00

When arranged with forked rod or harp connection to connect to rod of Wind Mill, we add $1.50 to list on sizes up to 4 inch, and $2.50 extra on the other sizes.

NEW "SYPHON" WORKING BARREL.

FOR HAND OR WIND MILL USE.

FIG. 776.

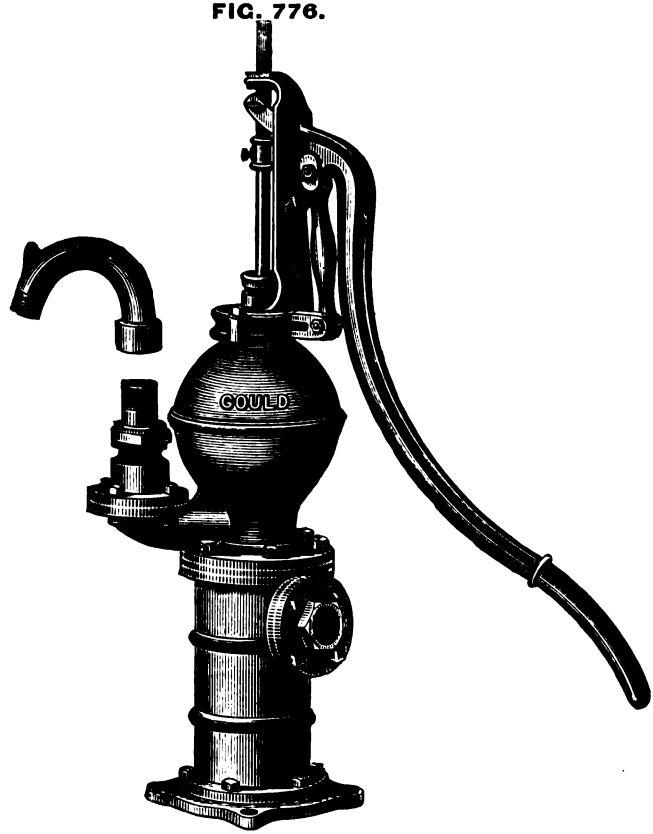


Fig. 776 is the same in all respects as our old Fig. 741, except in the 2½, 3, 3½ and 4 inch sizes. In these sizes we have changed the upper end of the Syphon air chamber to receive the same Wind Mill top as used on and explained under Fig. 422, page 68. The other sizes have not been changed in any respect.

It is our new Syphon Working Barrel, described on opposite page, arranged with Wind Mill head for either Wind Mill or hand power.

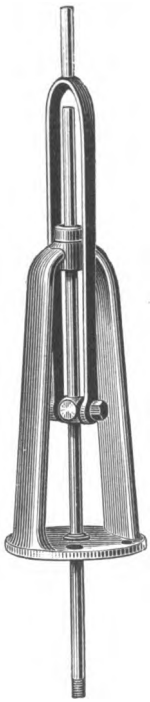
Hook spouts only sent when ordered, and then at an extra price.

FIG. 776. Sizes, Prices, Etc.

Diameter Inner Cyl.	Suction and Discharge.	Stroke by Hand.	Stroke by Power.	Capacity per Stroke.	BRASS INNER CYLINDER. Cipher.	Price.
2½ in.	1½ in.	6 in.	8½ in.	1·6 gal.	Tong	$28.50
3 "	1½ "	6 "	8½ "	1-4 "	Tongs	28.75
3½ "	2 "	6 "	8½ "	1-3 "	Tung	31.00
4 "	2 "	6 "	8½ "	2-5 "	Tonic	34.50
3½ "	2 "	10 "	10 "	2-5 "	Toot	33.00
4 "	2 "	10 "	10 "	1-2 "	Tooth	37.50
4½ "	2½ "	10 "	10 "	2-3 "	Vari	50.00
5 "	2½ "	10 "	10 "	7-8 "	Variably	55.00
5½ "	3 "	10 "	10 "	1 "	Variant	61.00
6 "	3 "	10 "	10 "	1 1-5 "	Variance	70.00

When arranged with a forked or crotched rod to connect to wood rod of Wind Mill we add $1.50 to list on sizes up to 4 in., and $2.50 on other sizes.

FIG. 746.



WELL PUMP HEAD.

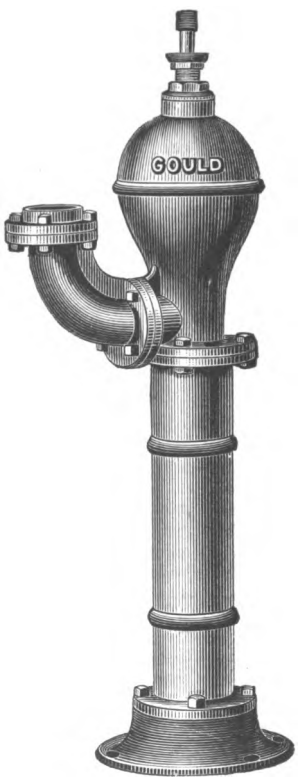
WITH PITMAN, GUIDE AND GUIDE ROD.

Fig. 746 represents a Well Pump Head, with guide rod, etc., to be used in connection with Fig. 743. We can make them to work either 14, 16 or 18 inch stroke, as ordered. The lower end of the piston rod shows a thread cut on it for ¾ inch wrought-iron pipe, or we can make to weld on to a solid iron rod if so desired. The pitman can be fitted as shown in the cut, or with a forked rod to connect to wood rod of Wind Mill.

FIG. 746. Price.

Complete, as shown in cut, ... (Validly.) $25.00

FIG. 743.



FLANGED DEEP WELL CYLINDER.

ON BASE.

Fig. 743 shows a Flanged Deep Well Cylinder surmounted with an air chamber. This Cylinder is made to work in either shallow or deep wells and is constructed of the very best materials. The discharge is at the side as shown in the cut. We make them iron or brass lined as per lists given below.

When ordered Brass Lined we put in a gun metal rod and brass lower valve.

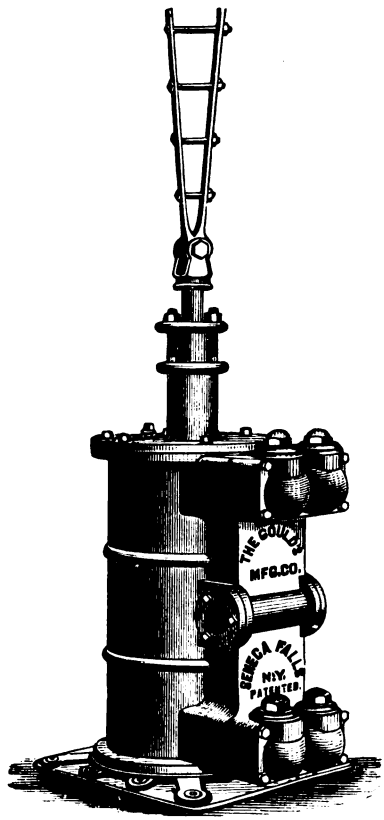
FIG. 743. Sizes, Prices, Etc.

No.	Diameter Cylinder.	Suction.	Dis.	Stroke.	Capacity per Stroke.	IRON.		BRASS LINED.	
						Cipher.	Price.	Cipher.	Price
8	4 in.	2 in.	1½ in.	14 in.	3-4 gal.	Valiant	$40.00	Valid	$48.00
16	6 "	2 "	1½ "	14 "	1 7-10 "	Valiance	75.00	Validity	85.00

PATENT GAS OR AIR PUMP.

FOR OIL WELLS, WHITE LEAD WORKS, ETC.

FIG. 280.



These Pumps are used very extensively in the oil wells of America, for exhausting the gas from them, and so largely increasing their production. They can also be used for compressing or exhausting air in large volumes. We solicit correspondence concerning these Pumps, and would be pleased to furnish a complete and detailed description of them, which space will not allow here.

FIG. 280. Sizes, Prices, Etc.

Diameter Cylinder.	Pipes.	Stroke.	Height Base to Cylinder Head.	Floor Space.	Cipher.	Price.
10	2 in.	20 in.	27½ in.	22 x 22 in.	Damp	$100.00
12	2 "	20 "	27½ "	22 x 22 "	Dampy	110.00
14	2 "	20 "	27½ "	22 x 22 "	Dance	125.00

HAND FORCE PUMPS.

The Pumps shown by Figs. 390, 391, 392, 393, 394, 395, 396, 397, 398 and 399 are known as our Hand Force Pumps, of which we make several sizes and styles of iron and brass, adapted to every conceivable use, so far as it is practicable to employ a Pump of this class. As much care and attention are exercised in the construction of these as any of our more expensive Pumps, the castings clean and smooth, bored out accurately, and subsequently reamed and polished, put together substantially and from the best material, painted and ornamented tastefully, and complete in every particular. Surmounted with a brass stuffing box, nicely turned up and finished, through which a brass-cased piston rod passes, and with a revolving brake or bearer, it is available in any imaginable position. We are confident no more complete or better finished goods are made by any house in this business.

Some of them have simply check valves to support the column of water in the discharge pipe, while being driven upwards, and prevent the water from coming back in the Pump again; others have air chambers to produce a continuous and steady flow of water with horizontal or perpendicular outlets, as occasion requires; others have both horizontal and perpendicular openings combined in one pump, so that water can be propelled in either of two directions, which is often essential; while others have cocks screwed for hose coupling, through which water can be drawn at the Pump, or, being closed, can be forced upwards to a reservoir or bath room in an upper story of a building. One style being provided with a gas pipe set length, can be used in exposed positions without danger of freezing. Some prefer these Pumps, because the valves can be submerged in water. Like other of our Pumps with cocks, water can be forced in two directions — used at the Pump or at a remote point.

The spout pieces and bottoms of air chambers have flanges, each of which are faced off perfectly true and held together, with packing between, by four bolts. The centres of these bolt holes are equi-distant from each other in the periphery of a circle, and render it possible to make a quarter, half or three-quarter turn of the air chamber if it is necessary. The flange of the check-valve case is provided with the same kind of holes, therefore the air chamber can be substituted for a check valve and *vice versa*. By taking so much care in the construction of our Pumps, duplicates, when ordered, always go right to their places without any fitting, and do not occasion those vexatious delays which are so disagreeable and withal so expensive in some instances. Our threads are all tested by gauges, too, being tool cut, and we guarantee every one to be the same on corresponding parts.

The water can be let out of the body of the Pump by raising the lever to its greatest height, which trips the lower valve, while under the air chamber is a hole into which a brass thumb screw is screwed, by removing which the water can be drawn off. The Pumps, therefore, have all the appliances for making them anti-freezing.

All these Pumps are arranged for lead or gas-pipe connections, and have brass valve seats.

SUCTION AND FORCE PUMP ON BASE.

WITH GOOSE-NECK DISCHARGE.

FIG. 735.

The cut represents a Force Pump of large capacity and very compact in form. It is a single acting Pump having two Cylinders and plungers, though from the internal arrangement and division of Cylinders it has the effect of a double acting Pump—in the way of producing a continuous and steady stream of water. The top is open so as to avoid the necessity of a stuffing box, and with the working parts of brass, and also a brass valve seat, it presents a very durable and capacious Pump.

FIG. 735. Sizes, Prices, Etc.

No.	Diameter Cylinder.	Suction.	Discharge.	Stroke.	IRON.		BRASS CYLINDERS AND PISTONS.		BRASS.	
					Cipher.	Price.	Cipher.	Price.	Cipher.	Price.
2	2½ in.	1¼ in.	1 in.	6 in.	Toise	$10.00	Token	$22.00	Tokay	$25.00
6	3½ "	1½ "	1¼ "	6 "	Tol	16.00	Told	39.00	Tola	43.00

FORCE PUMP ON BASE, UPPER DISCHARGE.

WITH REVOLVING BRAKE, CHECK VALVE AND BRASS PISTON ROD.

FIG. 390.

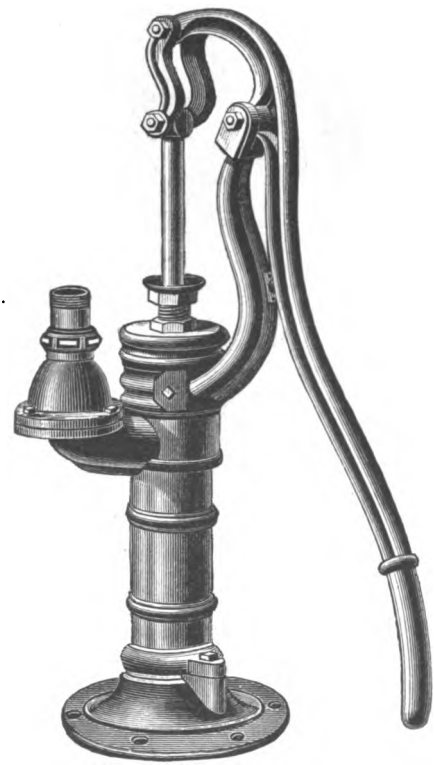


Fig. 390 represents our Hand Force Pump on base with upper check valve discharge. The height of Pump from base to lever top is from 30 to 35 inches, and the weight from 34 to 70 lbs., according to size.

We make this style of Pump of iron, or Cylinder and Piston of brass, or all brass except the lever, fulcrum and base, as per description given below.

FIG. 390. Sizes, Prices, Etc.

No.	Diameter Cylinder.	Suction and Dis.	Stroke.	Capacity per Stroke.	IRON.		BRASS CYLINDER.		BRASS.	
					Cipher	Price.	Cipher.	Price.	Cipher.	Price.
0	2 in.	1 in.	6 in.	1-12 gal.	Child	$8.00	Cart	$13.50	Carve	$20.00
2	2½ "	1¼ "	6 "	1-8 "	Chin	9.50	Drum	14.00	Drunk	21.00
4	3 "	1¼ "	6 "	1-6 "	Cite	11.00	Dry	15.00	Dryad	32.00
6	3½ "	1½ "	7½ "	1-3 "	Curd	17.00	Cured	24.00	Curer	38.00
8	4 "	2 "	7½ "	2-5 "	Cure	18.00	Curfue	30.00	Curious	47.00

FORCE PUMP ON PLANK. UPPER DISCHARGE.

WITH REVOLVING BRAKE, CHECK VALVE AND BRASS PISTON ROD.

FIG. 391.

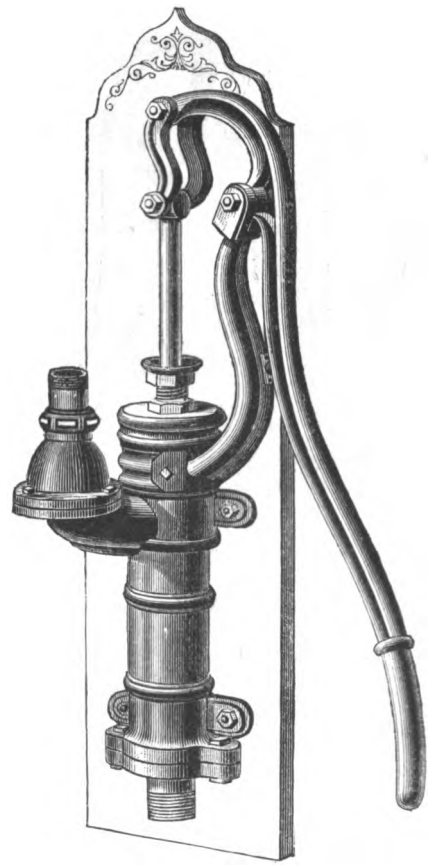


Fig. 391 represents our Hand Force Pump on Plank, with upper check valve discharge. The height of pump from base to lever top is from 30 to 35 inches, and the weight (including plank) from 44 to 80 lbs., according to size.

We make this style of Pump of Iron, or with Cylinder and Piston of brass, or entirely of brass, except the lever and fulcrum, as per description given below.

FIG. 391. Sizes, Prices, Etc.

No.	Diam. Cyl.	Suction and Dis	Stroke.	Capacity per Stroke.	IRON.		BRASS CYLINDER.		BRASS.	
					Cipher.	Price.	Cipher.	Price.	Cipher.	Price.
0	2 in.	1 in.	6 in.	1-12 gal.	Chime	$ 8.00	Case	$13.50	Chair	$20.00
2	2½ "	1¼ "	6 "	1-8 "	Chip	9.50	Ducat	14.00	Ducal	21.00
4	3 "	1¼ "	6 "	1-6 "	City	11.00	Duchy	15.00	Duchess	32.00
6	3½ "	1½ "	7½ "	1-3 "	Curl	17.00	Current	24.00	Curried	38.00
8	4 "	2 "	7½ "	2-5 "	Curly	18.00	Currier	30 00	Curry	47.00

FORCE PUMP ON BASE, UPPER DISCHARGE.

WITH REVOLVING BRAKE, AIR CHAMBER AND BRASS PISTON ROD.

FIG. 392.

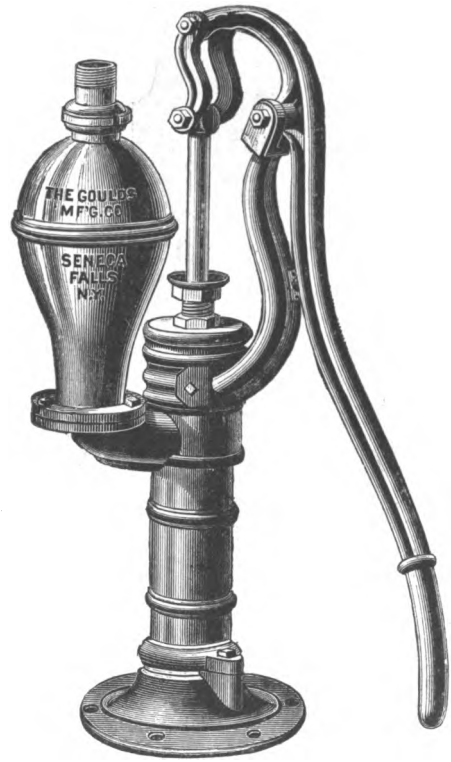


Fig. 392 represents our Hand Force Pump on base with upper discharge air chamber. The height of Pump from base to lever top is from 31 to 35 inches, and weight from 54 to 90 lbs., according to size.

We make this style of Pump of iron, or with Cylinder and Piston of brass, or entirely of brass, except lever, fulcrum and air chamber, as per description given below.

FIG. 392. Sizes, Prices, Etc.

No.	Diam. Cyl.	Suction and Dis.	Stroke.	Capacity per Stroke.	IRON.		BRASS CYLINDER.		BRASS.	
					Cipher.	Price.	Cipher.	Price.	Cipher.	Price.
2	2½ in.	1¼ in.	6 in.	1-8 gal.	Chirp	$10.00	Duck	$15.00	Ducked	$22.00
4	3 "	1¼ "	6 "	1-6 "	Civil	12.00	Due	16.00	Duct	33.00
6	3½ "	1½ "	7½ "	1-3 "	Vacancy	18.00	Vacate	26.00	Vacating	40.00
8	4 "	2 "	7½ "	2-5 "	Vacant	20.00	Vacated	32.00	Vacation	49.00

FORCE PUMP ON PLANK, UPPER DISCHARGE.

WITH REVOLVING BRAKE, AIR CHAMBER AND BRASS PISTON ROD.

FIG. 393.

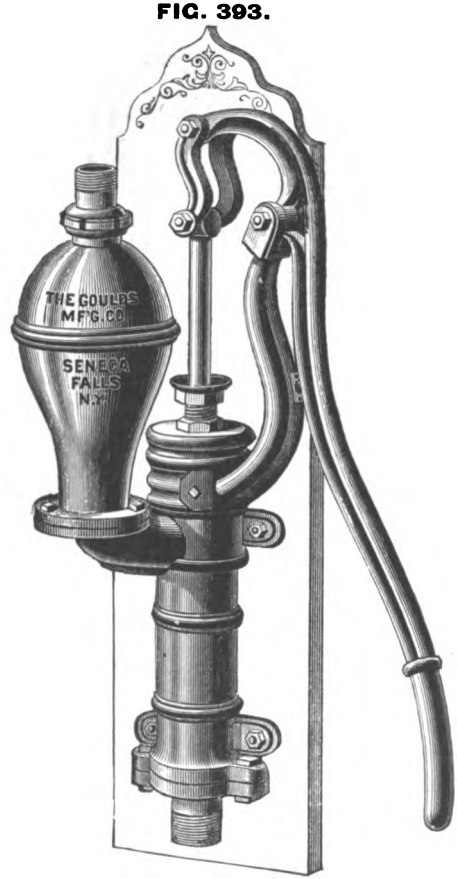


Fig. 393 represents our Hand Force Pump on plank with upper discharge air chamber. The height of Pump from base to lever top is from 31 to 35 inches, and the weight (including plank) from 64 to 100 lbs., according to size,

We make this style of Pump of iron, or with Cylinder and Piston of brass, or entirely of brass, except lever, fulcrum and air chamber, as per description given below.

FIG. 393. Sizes, Prices, Etc.

No.	Diameter Cylinder.	Suction and Dis.	Stroke.	Capacity per Stroke.	IRON.		BRASS CYLINDER.		BRASS.	
					Cipher.	Price.	Cipher.	Price.	Cipher.	Price.
2	2½ in.	1¼ in.	6 in.	1-8 gal.	Chop	$10.00	Dual	$15.00	Dub	$22.00
4	3 "	1¼ "	6 "	1-6 "	Claim	12.00	Duel	16.00	Dubious	33.00
6	3½ "	1½ "	7½ "	2-3 "	Vaccary	18.00	Vacuate	26.00	Vacuist	40.00
8	4 "	2 "	7½ "	2-5 "	Vaccine	20.00	Vacuation	32.00	Vacuity	49.00

FORCE PUMP ON BASE WITH COCK.

WITH REVOLVING BRAKE, AIR CHAMBER AND BRASS PISTON ROD.

FIG. 394.

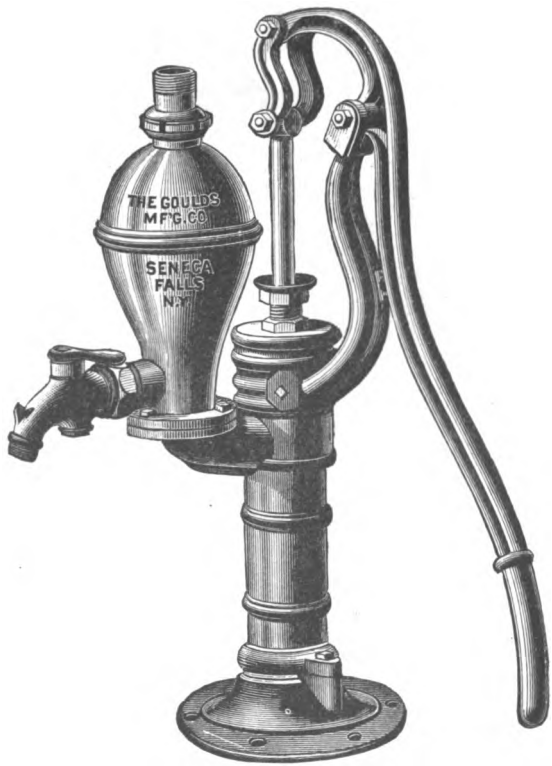


Fig. 394 represents our Hand Force Pump on base with double discharge air chamber and cock.

The height of Pump from base to lever top is from 31 to 35 inches, and the weight from 60 to 95 lbs., according to size.

We make this style of Pump of iron, or with Cylinder and Piston of brass, or entirely of brass, except lever, fulcrum, base and air chamber. All Pumps are provided with an iron cock with brass plug, unless otherwise ordered.

FIG. 394. Sizes, Prices, Etc.

No.	Diam. Cyl.	Suction and Discharge.	Stroke.	Capacity per Stroke.	IRON.		BRASS CYLINDER.		BRASS.	
					Cipher.	Price.	Cipher.	Price.	Cipher.	Price.
2	2½ in.	1¼ in.	6 in.	1-8 gal.	Drone	$12.50	Jug	$18.00	Dulcet	$23.50
4	3 "	1¼ "	6 "	1-6 "	Dross	14.50	Duke	19.50	Dulcify	35.00
6	3½ "	1½ "	7½ "	1-3 "	Cut	21.50	Cutlas	29.50	Cutler	43.50
8	4 "	2 "	7½ "	2-5 "	Cycle	22.50	Cygnet	35.50	Cymbal	52.50

FORCE PUMP ON PLANK, WITH COCK.

WITH REVOLVING BRAKE, AIR CHAMBER AND BRASS PISTON ROD.

FIG. 395.

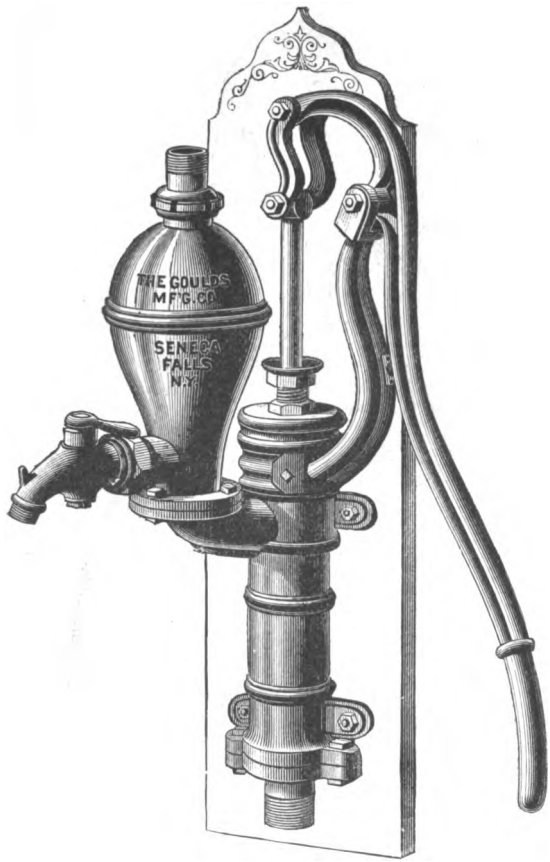


Fig. 395 represents our Hand Force Pump on plank, with double discharge air chamber and cock. The height of Pump from base to lever top is from 31 to 35 inches and the weight (including plank) from 70 to 105 lbs., according to size.

We make this style of Pump of iron, or with Cylinder and Piston of brass, or entirely of brass, except the lever, fulcrum and air chamber. All Pumps are provided with an iron cock with brass plug, unless otherwise ordered.

FIG. 395. Sizes, Prices, Etc.

No.	Diam. Cyl.	Suction and Dis.	Stroke.	Capacity per Stroke.	IRON.		BRASS CYLINDER.		BRASS.	
					Cipher.	Price.	Cipher.	Price.	Cipher.	Price.
2	2½ in.	1¼ in.	6 in.	1-8 gal.	Drop	$12.50	Duly	$18.00	Dump	$23.50
4	3 "	1¼ "	6 "	1-6 "	Drove	14.50	Dumb	19.50	Dumpy	35.00
6	3½ "	1½ "	7½ "	1-3 "	Curt	21.50	Curtail	29.50	Curtain	42.50
8	4 "	2 "	7½ "	2-5 "	Curve	22.50	Curved	35.50	Curvet	52.50

FORCE PUMP ON BASE, DOUBLE DISCHARGE.

WITH REVOLVING BRAKE, AIR CHAMBER AND BRASS PISTON ROD.

FIG. 396.

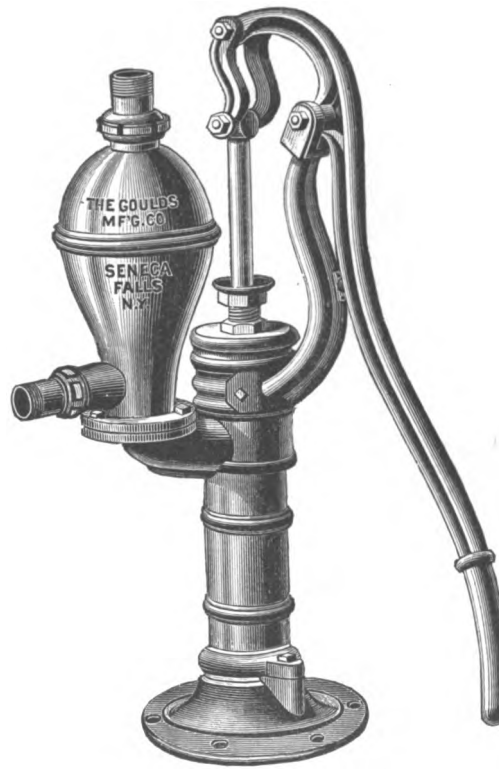


Fig. 396 represents our Hand Force Pump on base with double discharge air chamber. The height of Pump from base to lever top is from 31 to 35 inches, and the weight from 58 to 92 lbs., according to size.

We make this style of Pump of iron, or with Cylinder and Piston of brass, or entirely of brass, except the lever, fulcrum, base and air chamber, as per description given below.

FIG. 396. Sizes, Prices, Etc.

No.	Diam. Cyl.	Suction and Dis.	Stroke.	Capacity per Stroke.	IRON.		BRASS CYLINDER.		BRASS.	
					Cipher.	Price.	Cipher.	Price.	Cipher.	Price.
2	2½ in.	1¼ in.	6 in.	1-8 gal.	Fling	$11.00	Vacuous	$16.50	Vade	$22.00
4	3 "	1¼ "	6 "	1-6 "	Flip	13.00	Vacuum	18.00	Vagabond	33.50
6	3½ "	1½ "	7½ "	1-3 "	Dawn	19.00	Dawned	27.00	Dawning	41.00
8	4 "	2 "	7½ "	2-5 "	Day	20.00	Daycoal	33.00	Dayfly	50.00

FORCE PUMP ON PLANK, DOUBLE DISCHARGE.

WITH REVOLVING BRAKE, AIR CHAMBER AND BRASS PISTON ROD.

FIG. 397.

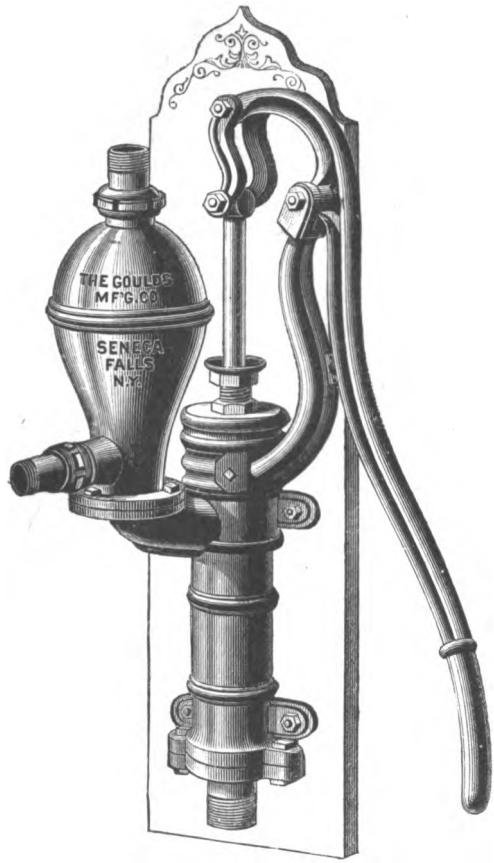


Fig. 397 represents our Hand Force Pump on plank with double discharge air chamber.

The height of Pump is from 31 to 35 inches, and the weight (including plank) from 68 to 102 lbs., according to size.

We make this style of Pump of iron, or with Cylinder and Piston of brass, or entirely of brass, except the lever, fulcrum and air chamber, as per description given below.

FIG. 397. Sizes, Prices, Etc.

No.	Diam. Cyl.	Suction and Dis.	Stroke.	Capacity per Stroke.	IRON.		BRASS CYLINDER.		BRASS.	
					Cipher.	Price.	Cipher.	Price.	Cipher.	Price.
2	2½ in.	1¼ in.	6 in.	1-8 gal.	Flint	$11.00	Vagary	$16.50	Vaginal	$22.00
4	3 "	1¼ "	6 "	1-6 "	Flirt	13.00	Vagient	18.00	Vaginant	33.50
6	3½ "	1½ "	7½ "	1-3 "	Demon	19.00	Demoness	27.00	Demoniac	41.00
8	4 "	2 "	7½ "	2-5 "	Demur	20.00	Demure	33.00	Demy	50.00

FORCE PUMP ON BASE, SIDE DISCHARGE.

WITH REVOLVING BRAKE, AIR CHAMBER AND BRASS PISTON ROD.

FIG. 398.

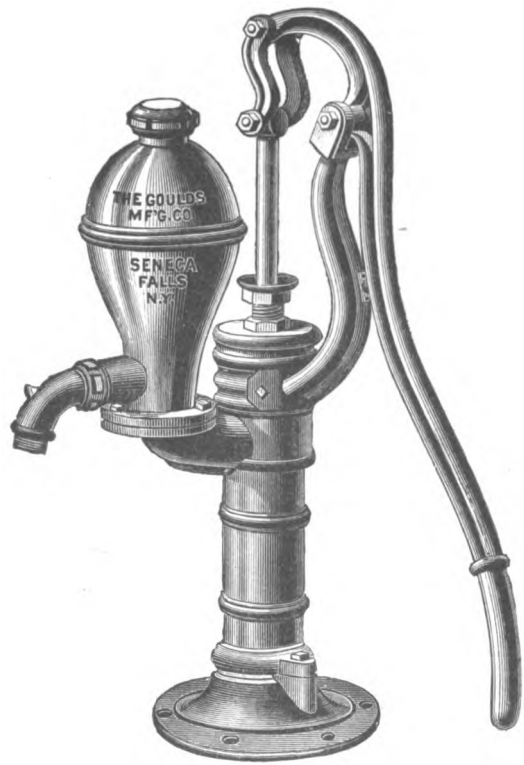


Fig. 398 represents our Hand Force Pump on base with horizontal discharge air chamber.

The height of Pump is from 31 to 35 inches, and the weight from 50 to 90 lbs., according to size.

We make this style of Pump of iron, or with Cylinder and Piston of brass, or entirely of brass, except lever, fulcrum, base and air chamber, as per description given below.

FIG. 398. Sizes, Prices, Etc.

No.	Diam. Cyl.	Suction and Dis.	Stroke.	Capacity per Stroke.	IRON.		BRASS CYLINDER.		BRASS.	
					Cipher.	Price.	Cipher.	Price.	Cipher.	Price.
2	2½ in.	1¼ in.	6 in.	1-8 gal.	Chuck	$10.00	Dun	$15.00	Dungeon	$22.00
4	3 "	1¼ "	6 "	1-6 "	Clam	12.00	Dunce	16.00	Dunned	33.00
6	3½ "	1½ "	7½ "	1-3 "	Vagous	18.00	Vagrant	25.00	Vail	40.00
8	4 "	2 "	7½ "	2-5 "	Vagrancy	21.00	Vague	32.00	Vailed	49.00

FORCE PUMP ON PLANK, SIDE DISCHARGE.

WITH REVOLVING BRAKE, AIR CHAMBER AND BRASS PISTON ROD.

FIG. 399.

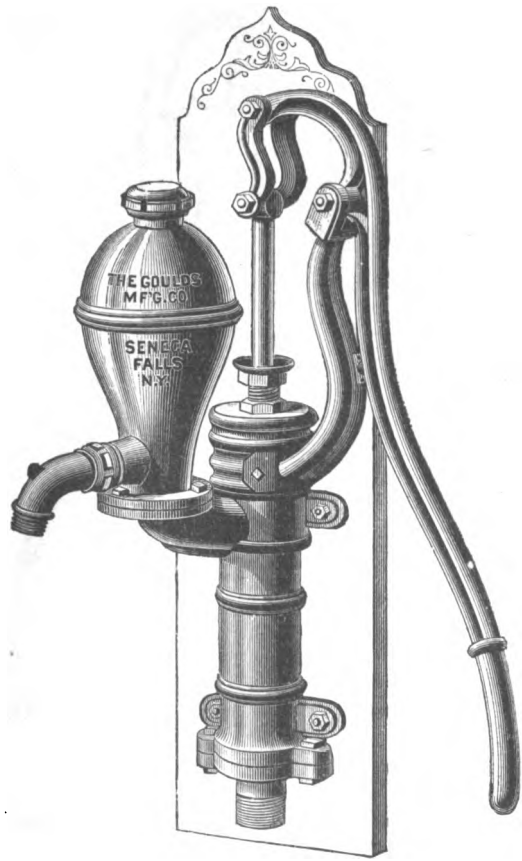


Fig. 399 represents our Hand Force Pump on Plank, with horizontal discharge, air chamber. The height of Pump is from 31 to 35 inches, and the weight, including plank, from 66 to 100 lbs.

We make this style of Pump of iron, or with Cylinder and Piston of brass, or entirely of brass, except the lever, fulcrum and air chamber, as per description given below.

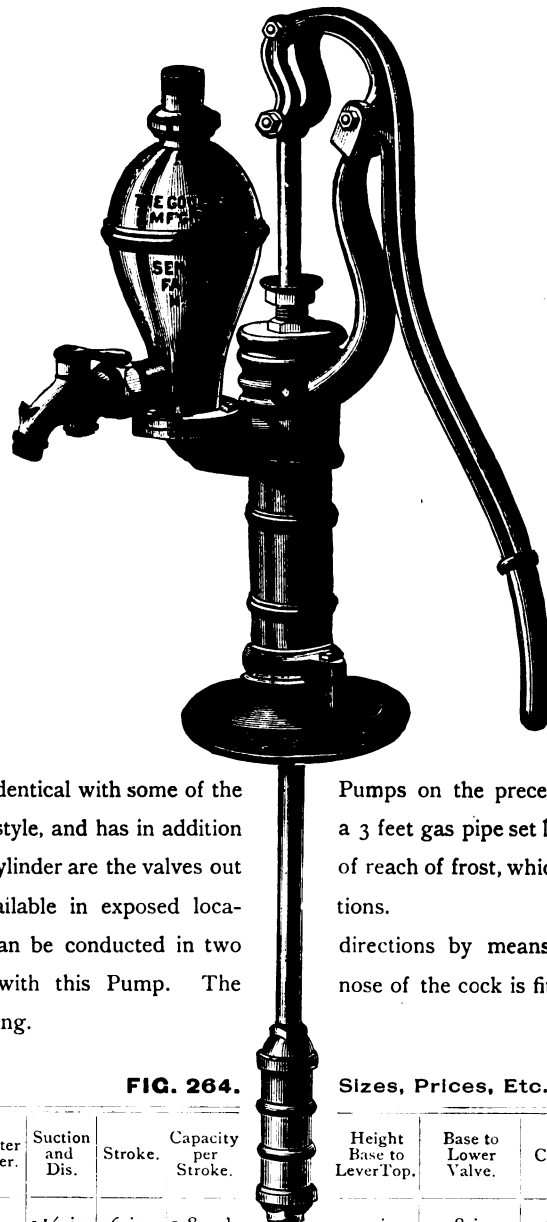
FIG. 399. Sizes, Prices, Etc.

No.	Diameter Cylinder.	Suction.	Stroke.	Capacity per Stroke.	IRON.		BRASS CYLINDER.		BRASS.	
					Cipher.	Price.	Cipher.	Price.	Cipher.	Price.
2	2½ in.	1¼ in.	6 in.	1-8 gal.	Churn	$10.00	Dupe	$15.00	Duskily	$22.00
4	3 "	1¼ "	6 "	1-6 "	Clamp	12.00	Dusk	16.00	Duskish	33.00
6	3½ "	1½ "	7½ "	1-3 "	Vailer	18.00	Vain	25.00	Vairy	40.00
8	4 "	2 "	7½ "	2-5 "	Vailing	21.00	Vainly	32.00	Valet	49.00

IRON FORCE PUMP, WITH COCK. ANTI-FREEZING.

WITH THREE FEET WROUGHT-IRON CONNECTING PIPE.

FIG. 264.



This is identical with some of the Pumps on the preceding pages in form and style, and has in addition a 3 feet gas pipe set length. In the working Cylinder are the valves out of reach of frost, which makes these Pumps available in exposed locations.

Water can be conducted in two directions by means of the cock furnished with this Pump. The nose of the cock is fitted for 1 inch hose coupling.

FIG. 264. Sizes, Prices, Etc.

No.	Diameter Cylinder.	Suction and Dis.	Stroke.	Capacity per Stroke.	Height Base to Lever Top.	Base to Lower Valve.	Cipher.	Price.
2	2½ in.	1¼ in.	6 in.	1-8 gal.	31 in.	48 in.	Clan	$16.00
4	3 "	1¼ "	6 "	1-6 "	31 "	48 "	Clap	18.00

VERTICAL POWER PISTON PUMP.

WITH CRANK SHAFT, PULLEY AND HANDLE, FOR HAND OR POWER.

FIG. 703.

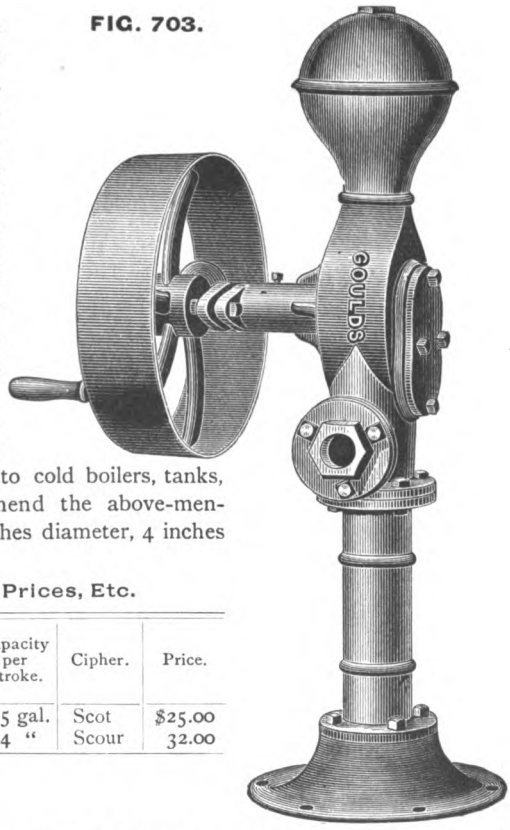


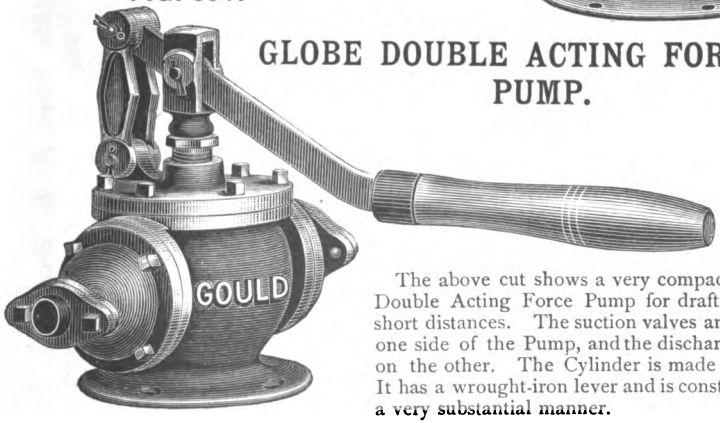
Fig. 703 is made to take the place of Fig. 599, and is an improvement upon that Pump. The changes in construction are as follows: A larger bearing on the drive side, the air chamber and globe are cast in one piece, by which means we render it much easier to take apart for repairs, and the stuffing box gland is made to screw up with bolts, instead of with a screw cap as on Fig. 599.

For raising water from wells, cisterns, etc., by hand or power, and forcing it into cold boilers, tanks, etc., we can safely recommend the above-mentioned Pump. Pulley 16 inches diameter, 4 inches face.

FIG. 703. Sizes, Prices, Etc.

No.	Diam. Cyl.	Suction and Dis.	Stroke.	Capacity per Stroke.	Cipher.	Price.
4	3 in.	1¼ in.	6 in.	1-5 gal.	Scot	$25.00
6	3½ "	1¼ "	6 "	1-4 "	Scour	32.00

FIG. 651.



GLOBE DOUBLE ACTING FORCE PUMP.

The above cut shows a very compact form of Double Acting Force Pump for drafting water short distances. The suction valves are both on one side of the Pump, and the discharge valves on the other. The Cylinder is made of brass. It has a wrought-iron lever and is constructed in a very substantial manner.

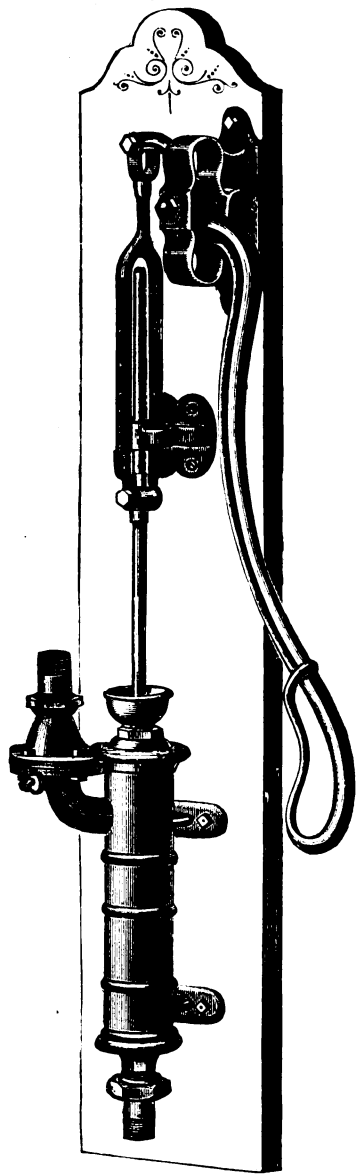
FIG. 651. Sizes, Prices, Etc.

No.	Dia. Cylinder.	Suction and Discharge.	Stroke.	Capacity per Revolution.	Cipher.	Price.
5	3¼ in.	1 in.	2½ in.	1-5 gal.	Ratio	$15.00

HOUSE FORCE PUMP.

WITH CHECK VALVE, MOUNTED ON PLANK—RIGHT AND LEFT-HANDED.

FIG. 440.



The cut represents our Single Acting Suction and Force Pump with brass piston rods, pitman and guide, mounted on a handsomely ornamented plank for in-door's use, and can be made either right or left handed.

It is generally employed for lifting water from wells or cisterns and forcing it up into a more elevated part of the house, for bath rooms, filling tanks, etc. Plumbers wishing to attach copper air chambers usually select this style.

The check valve can be removed and an air chamber substituted without extra fitting.

We make six sizes of this Pump of iron, or with Cylinder and Piston of brass, or entirely of brass, except the lever, fulcrum, and check valve, as per description given below.

The Iron and Brass Cylinder Pumps are fitted for iron pipe and the Brass Pumps for lead pipe, unless otherwise ordered.

FIG. 440. Sizes, Prices, Etc.

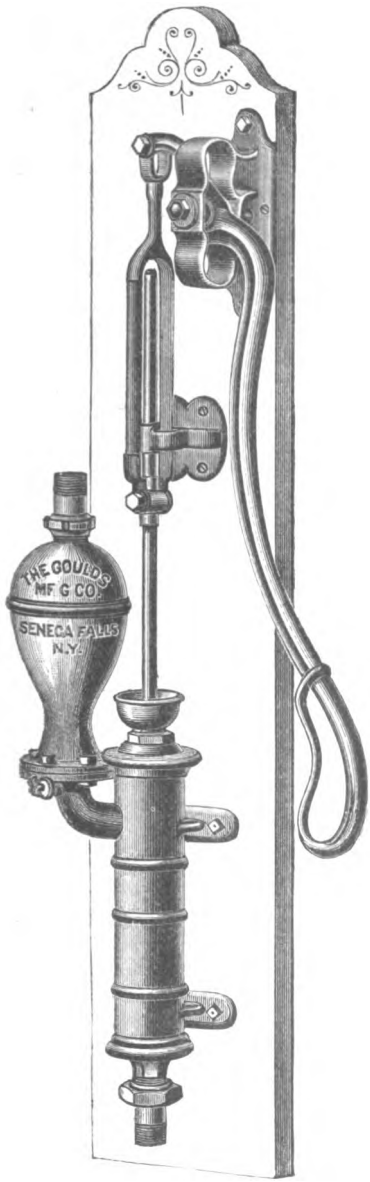
No.	Diameter Cylinder.	Suction and Dis.	Stroke.	Capacity per Stroke.	IRON. Cipher.	IRON. Price.	BRASS CYLINDER. Cipher.	BRASS CYLINDER. Price.	BRASS. Cipher.	BRASS. Price.
0	2 in.	1 in.	7 in.	1-10 gal.	Flit	$14.00	Dyer	$19.00	Dwarf	$26.00
2	2½ "	1¼ "	7 "	1-7 "	Float	15.00	Each	20.00	Dwell	30.00
3	2¾ "	1¼ "	7 "	1-6 "	Flock	15.75	Ead	21.00	Dwine	33.00
4	3 "	1¼ "	7 "	1-5 "	Flog	16.50	Eager	22.00	Dyed	35.00
5	3¼ "	1½ "	7 "	1-4 "	Flop	20.00	Eagerly	25.00	Dyke	40.00
6	3½ "	1½ "	7 "	3-10 "	Flora	22.00	Earing	32.00	Dull	45.00

When plank is not sent we deduct $1.00 from list.

HOUSE FORCE PUMP, WITH AIR CHAMBER.

MOUNTED ON PLANK, RIGHT AND LEFT-HANDED.

FIG. 441.



The cut represents the same Pump as shown by Fig. 440, with the addition of an air chamber, which insures a continuous stream of water, and relieves the pipe from the concussion of the water. There is no Pump built that is better adapted to house use. The flange of the air chamber is fastened to the flange of the spout by bolts with a packing between. The air chamber can make a quarter, half or three-quarter turn after taking out the bolts in flanges, without extra fitting.

The air chamber can be removed and a check valve substituted without extra fitting.

We make six sizes of this Pump of iron, or with Cylinder and Piston of brass, or entirely of brass except lever, fulcrum and air chamber, as per description given below. The Iron and Brass Cylinder Pumps are fitted for wrought iron pipe and the Brass Pumps for lead pipe, unless otherwise ordered.

FIG. 441. Sizes, Prices, Etc.

No.	Diameter Cylinder.	Suction and Dis.	Stroke.	Capacity per Stroke.	IRON. Cipher.	IRON. Price.	BRASS CYLINDER. Cipher.	BRASS CYLINDER. Price.	BRASS. Cipher.	BRASS. Price.
0	2 in.	1 in.	7 in.	1-10 gal	Floss	$16.00	Earn	$22.00	Eagle	$28.00
2	2½ "	1¼ "	7 "	1-7 "	Flour	17.00	Earth	23.00	Ear	32.00
3	2¾ "	1¼ "	7 "	1-6 "	Flout	17.75	Earwig	24.00	Easter	35.00
4	3 "	1¼ "	7 "	1-5 "	Flow	18.50	Ease	25.00	Early	37.00
5	3¼ "	1½ "	7 "	1-4 "	Flown	23.00	Easel	28.00	Easting	43.00
6	3½ "	1½ "	7 "	3-10 "	Fluid	25.00	Easily	35.00	Flail	50.00

Double discharge air chamber supplied at same price, or brass air chambers made to order at difference in cost of material. If sent without plank we deduct $1.00 from list.

HOUSE FORCE PUMP, WITH COCK.

MOUNTED ON PLANK, RIGHT AND LEFT-HANDED.

FIG. 442.

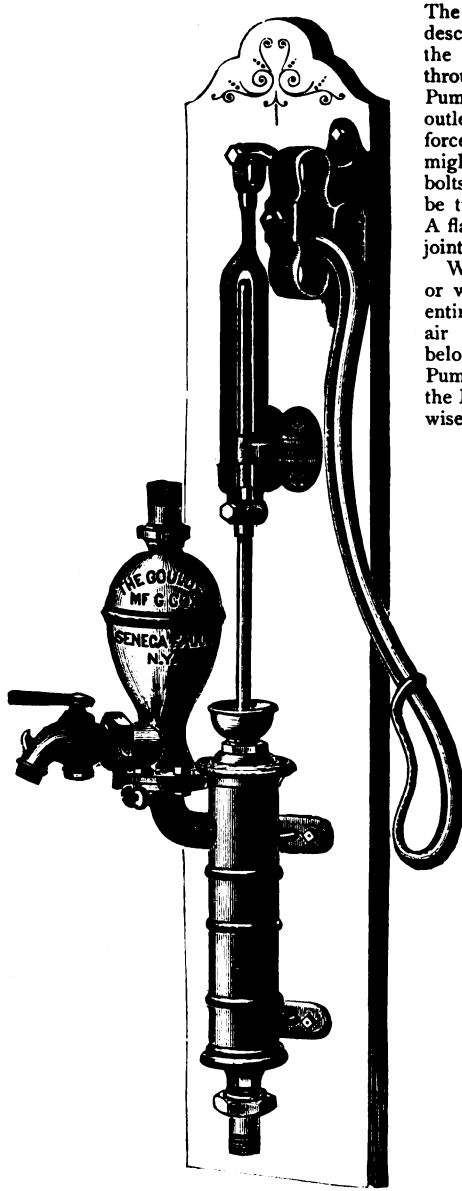


Fig. 442 represents our House Force Pump with air chamber and cock on plank. The good qualities of the Pumps previously described, prevail in this one, but this has the additional convenience of a faucet through which water can be drawn at the Pump. The faucet has threads cut on the outlet where hose can be coupled and water forced through it, which, in case of fire, might often prove invaluable. By taking bolts out of flanges of air chamber it can be turned around to almost any position. A flange joint is much preferable to a screw joint.

We make six sizes of this Pump of iron, or with Cylinder and Piston of brass, or entirely of brass, except lever, fulcrum and air chamber, as per description given below. The Iron and Brass Cylinder Pumps are fitted for wrought iron pipe, and the Brass Pumps for lead pipe, unless otherwise ordered.

FIG. 442. Sizes, Prices, Etc.

No.	Diameter Cylinder.	Suction and Dis.	Stroke.	Capacity per Stroke.	IRON. Cipher.	IRON. Price.	BRASS CYLINDER. Cipher.	BRASS CYLINDER. Price.	BRASS. Cipher.	BRASS. Price.
0	2 in.	1 in.	7 in.	1-10 gal	Fluke	$18.00	Fog	$27.00	Fly	$35.00
2	2½ "	1¼ "	7 "	1-7 "	Flume	19.00	Foil	28.00	Foal	37.00
3	2¾ "	1¼ "	7 "	1-6 "	Flung	20.00	Foiler	29.00	Foaling	40.00
4	3 "	1¼ "	7 "	1-5 "	Flush	22.00	Fold	30.00	Foam	42.00
5	3¼ "	1½ "	7 "	1-4 "	Flute	26.00	Folder	33.00	Foaming	49.00
6	3½ "	1½ "	7 "	3-10 "	Flux	28.50	Foliage	37.50	Foe	56.00

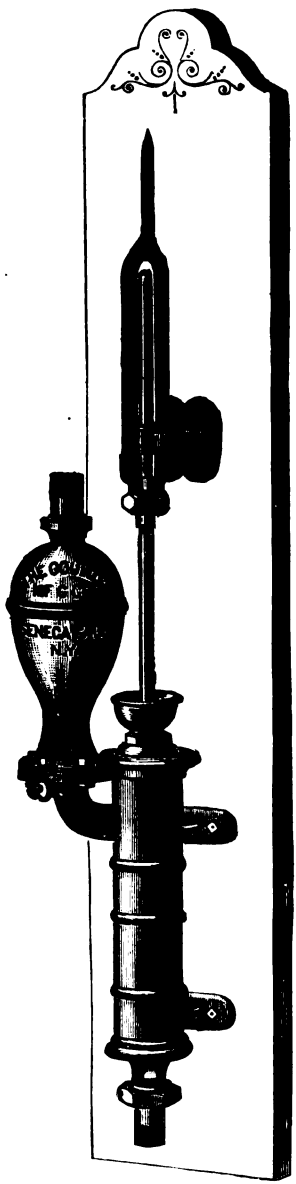
Brass air chambers made to order at difference in cost of material. When the plank is not sent we deduct $1.00 from list.

All brass cocks furnished when ordered.

IRON FORCE PUMP, WITH AIR CHAMBER.

MOUNTED ON PLANK, WITH PITMAN AND GUIDE FOR POWER.

FIG. 714.



The cut represents the same Pump as shown by Fig. 441, page 103, less the lever and bearer, but with the pitman and guide arranged for power. The flange of the air chamber is fastened to the flange of the spout by bolts with a packing between. The air chamber can make a quarter, half or three-quarter turn, after taking out the bolts in flanges, without extra fitting.

We make five sizes of iron as follows, fitted for wrought iron pipe unless otherwise ordered, and can make as well of brass if desired.

When not mounted on plank a reduction of $1.00 in list is made.

The air chamber can be arranged with two discharges, if so desired, at same list price.

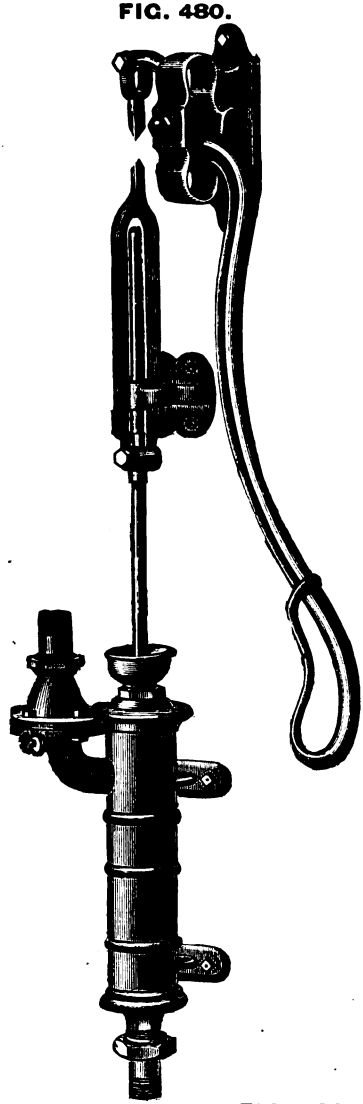
FIG. 714. Sizes, Prices, Etc.

No.	Diam. Cyl.	Suction and Dis.	Capacity per Stroke.	Stroke.	Cipher.	Price.
2	2½ in.	1¼ in.	1-7 gal.	7 in.	Text	$17.00
3	2¾ "	1¼ "	1-6 "	7 "	Thaw	17.75
4	3 "	1¼ "	1-5 "	7 "	Thorn	18.50
5	3¼ "	1½ "	1-4 "	7 "	Throb	23.00
6	3½ "	2 "	3-10 "	7 "	Tick	25.00

WELL FORCE PUMP, UNMOUNTED.

WITH PITMAN, GUIDE AND GUIDE ROD.

FIG. 480.



The cut represents a Pump very similar to Fig. 440, page 102, with disconnected rod, but not mounted on plank.

The Cylinder can be located in a well or cistern any distance below the bearer or brake, and is set the same as Fig. 281, page 108, to which we refer for full information.

The Iron Pumps are fitted for wrought-iron pipe and the Brass Pumps for lead pipe unless otherwise ordered.

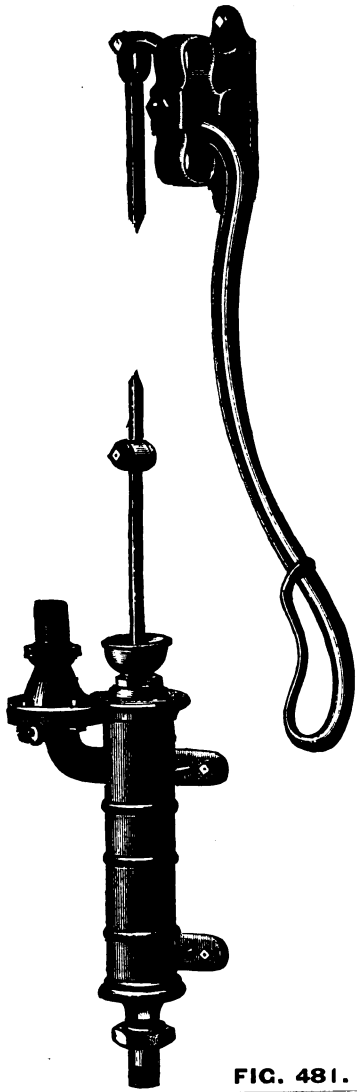
FIG. 480. Sizes, Prices, Etc.

No.	Diameter Cylinder.	Suction and Dis.	Stroke.	Capacity per Stroke.	IRON.		BRASS.	
					Cipher.	Price.	Cipher.	Price.
0	2 in.	1 in.	7 in.	1-10 gal.	Grass	$13.00	Grim	$23.50
2	2½ "	1¼ "	7 "	1-7 "	Grate	13.50	Grin	24.50
3	2¾ "	1¼ "	7 "	1-6 "	Gray	14.00	Grip	27.50
4	3 "	1¼ "	7 "	1-5 "	Graze	15.50	Grist	33.00
5	3¼ "	1½ "	7 "	1-4 "	Greet	19.00	Grit	36.00
6	3½ "	2 "	7 "	3-10 "	Grew	20.50	Groom	46.00

WELL FORCE PUMP, UNMOUNTED.

WITHOUT PITMAN, GUIDE AND GUIDE ROD.

FIG. 481.



The cut represents a Pump similar to Fig. 480, on previous page, except that it has not the pitman guide or guide rod. It is, however, just as serviceable for short suction and somewhat cheaper.

The Cylinder can be placed at either the bottom of well or cistern, or within, say, 15 or 20 feet (suction distance) of water, and then proceed as instructed under Fig. 281, page 108.

The Iron Pumps are fitted for wrought iron pipe, and the Brass Pumps for lead pipe unless otherwise ordered.

FIG. 481. Sizes, Prices, Etc.

No.	Diameter Cylinder.	Suction and Discharge.	Stroke.	Capacity per Stroke.	IRON.		BRASS.	
					Cipher.	Price.	Cipher.	Price.
0	2 in.	1 in.	7 in.	1-10 gal.	Grope	$10.75	Grunt	$21.00
2	2½ "	1¼ "	7 "	1-7 "	Group	11.00	Guard	22.00
3	2¾ "	1¼ "	7 "	1-6 "	Grout	11.50	Guess	25.00
4	3 "	1¼ "	7 "	1-5 "	Grow	13.00	Guide	30.00
5	3¼ "	1½ "	7 "	1-4 "	Grub	16.00	Guile	33.00
6	3½ "	2 "	7 "	3-10 "	Gruel	17.50	Gulf	43.00

DEEP WELL FORCE PUMP, UNMOUNTED.

WITH PITMAN, GUIDE AND GUIDE ROD.

FIG. 281.

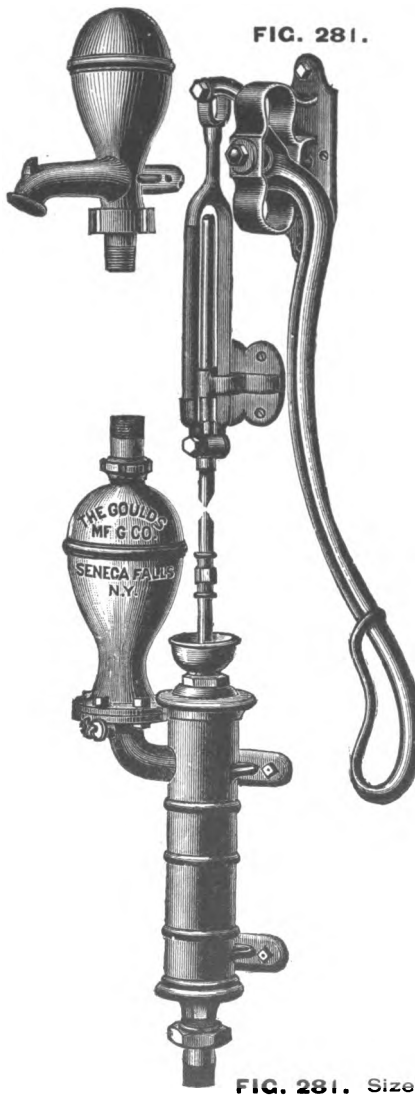


Fig. 281 represents a Deep Well Force Pump, for which there is still a large demand in some sections of the country.

The following instructions should be observed in setting these Pumps: At a point, say 15 or 20 feet from the bottom of the well, secure the Pump to a timber or plank. At a convenient height above the surface of the well locate the lever and spout air chamber, either to the same timber or something else stiff and strong. Connect the air chamber above with the one below by a pipe.. Screw into the bottom of the Pump your suction pipe, extending to within a few inches of the bottom of the well. Join the stub end attached to the lever to the stub end of the Pump, and your Pump is ready for use.

When ordered without spout air chamber, a deduction of $1.00 in list will be made.

We construct these Pumps in iron or brass, and fit the Iron Pumps for wrought-iron pipe, and the Brass Pumps for lead pipe, unless otherwise ordered.

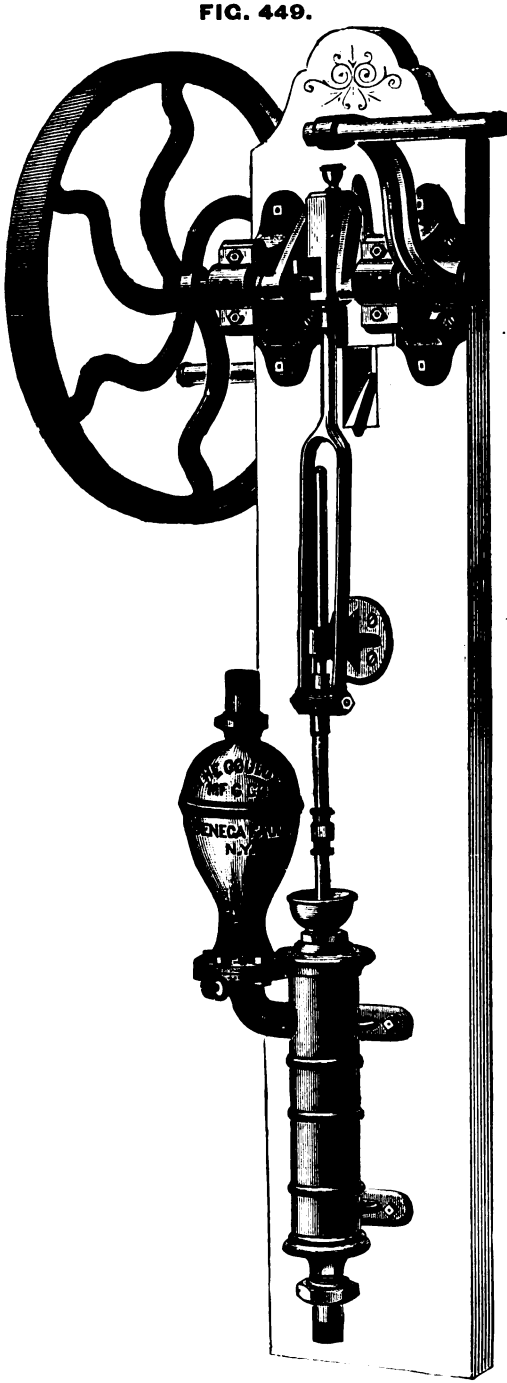
FIG. 281. Sizes, Prices, Etc.

No.	Diameter Cylinder.	Suction and Discharge.	Stroke.	Capacity per Stroke.	IRON.		BRASS.	
					Cipher.	Price.	Cipher.	Price.
0	2 in.	1 in.	7 in.	1-10 gal.	Dandy	$13.50	Darn	$27.00
2	2½ "	1¼ "	7 "	1-7 "	Dane	14.00	Dart	28.00
3	2¾ "	1¼ "	7 "	1-6 "	Dank	14.50	Dash	31.00
4	3 "	1¼ "	7 "	1-5 "	Dare	16.50	Date	36.50
5	3¼ "	1½ "	7 "	1-4 "	Dared	20.00	Daub	39.50
6	3½ "	2 "	7 "	3-10 "	Dark	22.00	Davit	49.50

FORCE PUMP, WITH FLY WHEEL.

MOUNTED ON PLANK, WITH CRANK SHAFT AND WINCH HANDLES.

FIG. 449.



This cut accurately represents our Single Acting Iron Force Pump, mounted on plank, with balance wheel, steel crank shaft and winch handles, built in a most thorough and workmanlike manner. It is very frequently the case that hotels, boarding schools and other institutions where a large amount of water is daily consumed, are obliged to elevate from cisterns or wells all their water to the topmost story of the building, which requires a vast outlay of power.

The Pump is so constructed that two or four men can work it.

When so ordered we can put on a larger balance wheel with 3½ inch face, 24 inch diameter, on to which a belt could be run, at $3.00 extra list.

Double discharge air chambers supplied at same price. With these we can furnish our iron cocks with brass plugs at $2.50 extra, or all brass cocks at $5.00 extra list.

No.	Diam. Cyl.	Suction and Dis.	Stroke	Capacity per Stroke.	IRON. Cipher.	IRON. Price.	BRASS. Cipher.	BRASS. Price.
0	2 in.	1¼ in	7 in.	1-10 gal.	Frith	$37.00	Frost	$47.00
2	2½ "	1¼ "	7 "	1-7 "	Friz	39 00	Froth	48.00
3	2¾ "	1¼ "	7 "	1-6 "	Frock	39.50	Frown	50.00
4	3 "	1¼ "	7 "	1-5 "	Frog	40.00	Frowzy	60.00
5	3¼ "	1½ "	7 "	1-4 "	From	42 00	Fruit	72.00
6	3½ "	1½ or 2	7 "	3-10 "	Front	45 00	Fry	85.00

FIG. 449. Sizes, Prices, Etc.

SUCTION AND FORCE PUMP.

MOUNTED ON PLANK, WITH CHECK VALVE AND BALANCE WHEEL

FIG. 712.

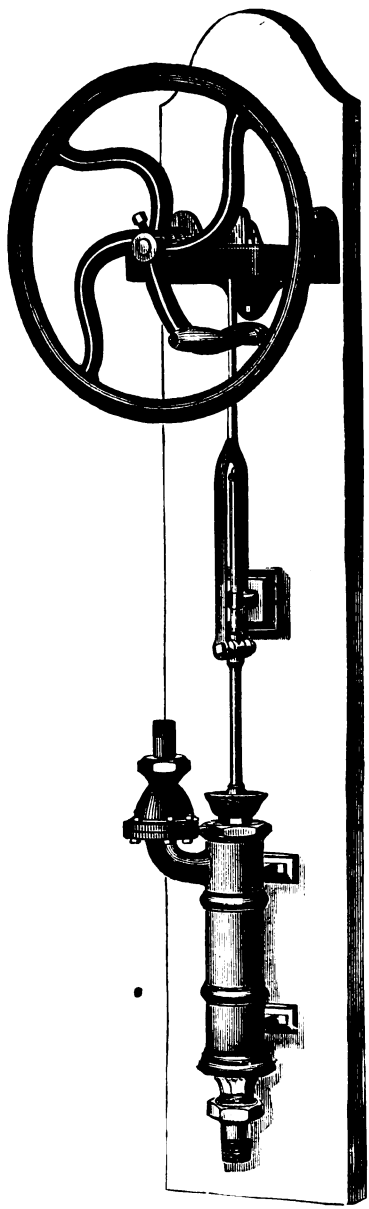


Fig. 712 shows a Single Acting Pump, mounted on plank, with crank shaft and balance wheel. We can also furnish our Double Acting Pumps, like Fig. 271, page 118, mounted in the same way, if desired. The lists on both kinds of Pumps we give below.

In ordering always state whether you want a Single or Double Acting Pump.

We can construct these Pumps of brass, when so ordered.

FIG. 712. Sizes, Prices, Etc.

No	Diam. Cyl.	Suction and Dis.	Stroke.	SINGLE ACTING PUMP. Capacity per Stroke.	Cipher.	Price.	DOUBLE ACTING PUMP. Capacity per Revolution.	Cipher.	Price.
2	2½ in.	1¼ in.	7 in.	1-7 gal.	Tabor	$27.00	2-7 gal.	Talon	$29.00
3	2¾ "	1¼ "	7 "	1-6 "	Tack	29.00	1-3 "	Tame	33.00
4	3 "	1¼ "	7 "	1-5 "	Tag	32.00	2-5 "	Tank	36.50
5	3¼ "	1¼ "	7 "	1-4 "	Tail	35.00	. . . .	. . . .	. . . .
6	3½ "	1½ or 2	7 "	3-10 "	Tally	39.00	3-5 "	Tansy	43.00

We deduct $1.00 from list when the plank is not sent.

SUCTION AND FORCE PUMP.

MOUNTED ON PLANK, WITH AIR CHAMBER AND BALANCE WHEEL.

FIG. 713.

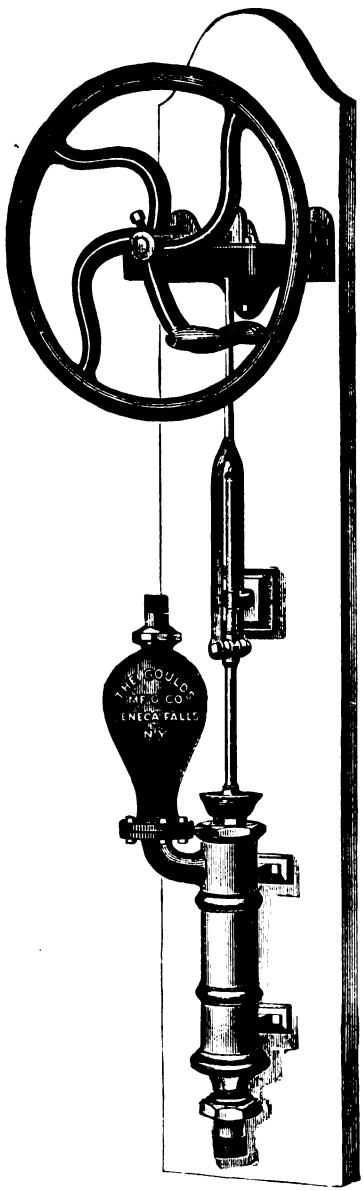


Fig. 713 shows a Single Acting Pump, mounted on plank, with crank shaft and balance wheel; also, with air chamber.

We can also furnish our Double Acting Pump, like Fig. 272, page 119, mounted in the same way, if desired. The lists on both kinds of Pumps we give below.

In ordering, always state whether you want a Single or Double Acting Pump.

We can construct these Pumps of brass, if so ordered — also add a cock to the air chamber—at proportionate advance in list.

FIG. 713. Sizes, Prices, Etc.

No.	Diam. Cyl.	Suction and Dis.	Stroke.	SINGLE ACTING PUMP. Capacity per Stroke.	Cipher.	Price.	DOUBLE ACTING PUMP. Capacity per Revolution.	Cipher.	Price.
2	2½ in.	1¼ in.	7 in.	1-7 gal.	Tare	$29.00	2-7 gal.	Team	$31.50
3	2¾ "	1¼ "	7 "	1-6 "	Tart	31.00	1-3 "	Tear	34.00
4	3 "	1¼ "	7 "	1-5 "	Task	34.50	2-5 "	Tenor	38.50
5	3¼ "	1½ "	7 "	1-4 "	Tax	38.00	. . .	. . .	. . .
6	3½ "	2 "	7 "	3-10 "	Tea	42.00	3-5 "	Tent	46.00

We deduct $1.00 from list when the plank is not sent.

SUCTION AND FORCE PUMP.

MOUNTED ON PLANK, WITH CHECK VALVE AND BALANCE WHEEL

FIG. 712.

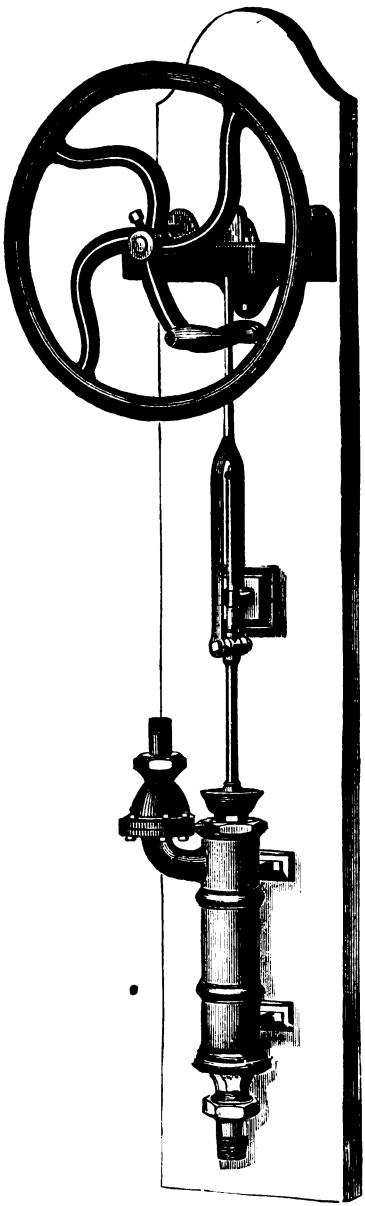


Fig. 712 shows a Single Acting Pump, mounted on plank, with crank shaft and balance wheel. We can also furnish our Double Acting Pumps, like Fig. 271, page 118, mounted in the same way, if desired. The lists on both kinds of Pumps we give below.

In ordering always state whether you want a Single or Double Acting Pump.

We can construct these Pumps of brass, when so ordered.

FIG. 712. Sizes, Prices, Etc.

No	Diam. Cyl.	SINGLE ACTING PUMP. Suction and Dis.	Stroke.	Capacity per Stroke.	Cipher.	Price.	DOUBLE ACTING PUMP. Capacity per Revolution.	Cipher.	Price.
2	2½ in.	1¼ in.	7 in.	1-7 gal.	Tabor	$27.00	2-7 gal.	Talon	$29.00
3	2¾ "	1¼ "	7 "	1-6 "	Tack	29.00	1-3 "	Tame	33.00
4	3 "	1¼ "	7 "	1-5 "	Tag	32.00	2-5 "	Tank	36.50
5	3¼ "	1½ "	7 "	1-4 "	Tail	35.00	. . . .	. . . .	. . . .
6	3½ "	1½ or 2	7 "	3-10 "	Tally	39.00	3-5 "	Tansy	43.00

We deduct $1.00 from list when the plank is not sent.

SUCTION AND FORCE PUMP.

MOUNTED ON PLANK, WITH AIR CHAMBER AND BALANCE WHEEL.

FIG. 713.

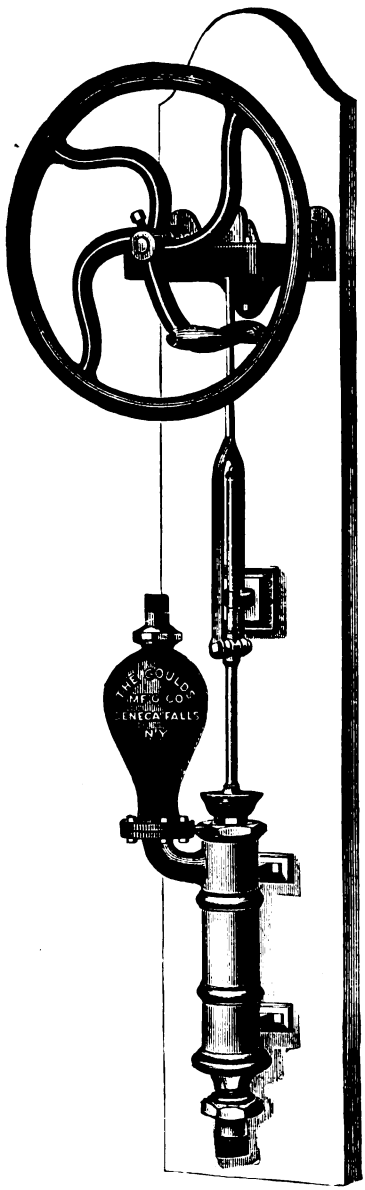


Fig. 713 shows a Single Acting Pump, mounted on plank, with crank shaft and balance wheel; also, with air chamber.

We can also furnish our Double Acting Pump, like Fig. 272, page 119, mounted in the same way, if desired. The lists on both kinds of Pumps we give below.

In ordering, always state whether you want a Single or Double Acting Pump.

We can construct these Pumps of brass, if so ordered — also add a cock to the air chamber—at proportionate advance in list.

FIG. 713. Sizes, Prices, Etc.

No.	Diam. Cyl.	Suction and Dis.	Stroke.	SINGLE ACTING PUMP. Capacity per Stroke.	Cipher.	Price.	DOUBLE ACTING PUMP. Capacity per Revolution.	Cipher.	Price.
2	2½ in.	1¼ in.	7 in.	1-7 gal.	Tare	$29.00	2-7 gal.	Team	$31.50
3	2¾ "	1¼ "	7 "	1-6 "	Tart	31.00	1-3 "	Tear	34.00
4	3 "	1¼ "	7 "	1-5 "	Task	34.50	2-5 "	Tenor	38.50
5	3¼ "	1½ "	7 "	1-4 "	Tax	38.00	. . . .	. . . .	. . . .
6	3½ "	2 "	7 "	3-10 "	Tea	42.00	3-5 "	Tent	46.00

We deduct $1.00 from list when the plank is not sent.

SUCTION AND FORCE PUMP.

MOUNTED ON DOUBLE PLANK, WITH HEAVY FLY WHEEL, CRANK SHAFT, GUIDE ROD AND WINCH HANDLE.

FIG. 466.

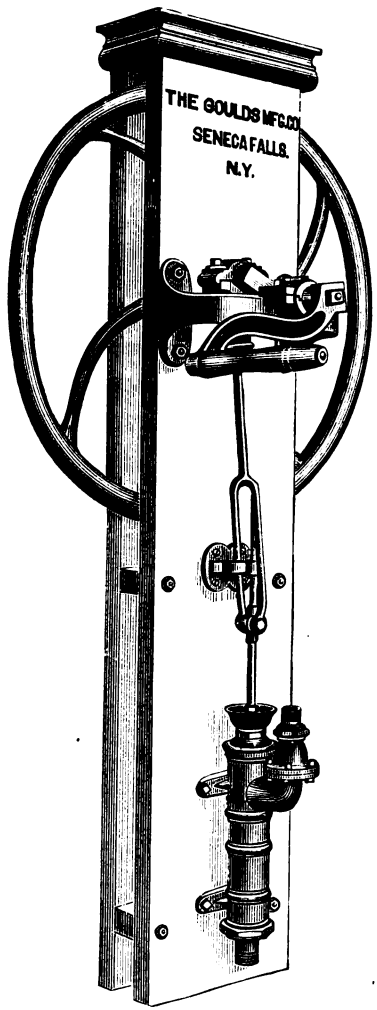


Fig. 466 represents our new Single Acting Suction and Force Pump mounted on double plank, with heavy fly wheel, crank shaft, guide rod and winch handle.

With parties desiring to elevate large quantities of water by hand power this device has found much favor.

It is strong, compact, and well built in every part, and by means of the extra large and heavy fly wheel the usual labor is much decreased.

We deduct $9.00 from list when ordered without fly wheel, and same when ordered without plank. We can also arrange any size of our Double Acting Pumps, Figs. 271 and 272, pages 118 and 119, as shown above.

N. B.—Although not as shown in cut, above Pump is *same* size as our Fig. 440, page 102.

FIG. 466. Sizes, Prices, Etc.

No.	Diameter Cylinder.	Suction and Discharge.	Stroke.	Capacity per Stroke.	IRON.		BRASS.	
					Cipher.	Price.	Cipher.	Price.
2	2½ in.	1¼ in.	6½ in.	1-8 gal.	Glean	$48.00	Gloat	$60.00
3	2¾ "	1¼ "	6½ "	1-6 "	Glee	50.00	Globe	65.00
4	3 "	1¼ "	6½ "	1-5 "	Glen	55.00	Gloss	75.00
5	3¼ "	1½ "	6½ "	1-4 "	Glib	62.00	Glow	80.00
6	3½ "	2 "	6½ "	3-10 "	Glide	66.00	Glue	90.00

DESCRIPTION OF FIGS. 468 AND 469.

The cuts on pages 114 and 115 show our Figs. 468 and 469 respectively. These Pumps are a combination of two Single Acting Pumps, joined at top and bottom by flange joints, with one induction and two eduction openings. This arrangement gives a perfect and complete Double Acting Pump of the most approved type, which will be found to be very useful in distilleries, mills, factories, or at railroad stations, for forcing water by hand power into tanks, tubs, etc., elevated any reasonable distance above the Pump.

An air chamber relieves the Pump of the concussion of the water settling back after each stroke, while a vacuum chamber attached to the suction pipe serves as a cushion for the water to strike against. Underneath the vacuum chamber is a check valve, which prevents the water from getting out of the Pump, keeping the lower valves submerged constantly; while, if necessary, the water can all be withdrawn from the entire Pump by unscrewing the necessary plugs provided for that purpose. There is a cap on top of this same chamber which can be unscrewed and water poured in for priming the Pump, should it be necessary. In Fig. 468 the levers are wrought-iron and very strong, and long enough for two or four men to work on them. The Pump is mounted on a mortised frame work, pinned together so that it is impossible for it to warp out of shape and bind the Pump, which would be inevitable if mounted on the ordinary plank constructed of one single piece. Fig. 469 is the same Pump mounted on a frame work of similar character, with fly wheel, winch handle, etc.

The momentum of the fly wheel, once set in action, aids in overcoming the inertia of the water as the piston rod passes the centres. For a Pump of this kind we know of no other so complete and substantial in all its details, and we can unqualifiedly commend it to those in want of such a device. We can build them of brass when ordered, and refer to our tables for sizes, prices, etc.

FIG. 468. Sizes, Prices, Etc.

No.	Diameter Cylinders.	Suction and Discharge.	Stroke.	Capacity per Revolution.	IRON.		BRASS.	
					Cipher.	Price.	Cipher.	Price.
2	2½ in.	1½ in.	7 in.	2-7 gal.	Glum	$37.50	Gnaw	$52.00
4	3 "	2 "	7 "	2-5 "	Glut	50.00	Gnu	84.00
8	4 "	2½ "	8 "	4-5 "	Gnat	70.00	Gold	128.00

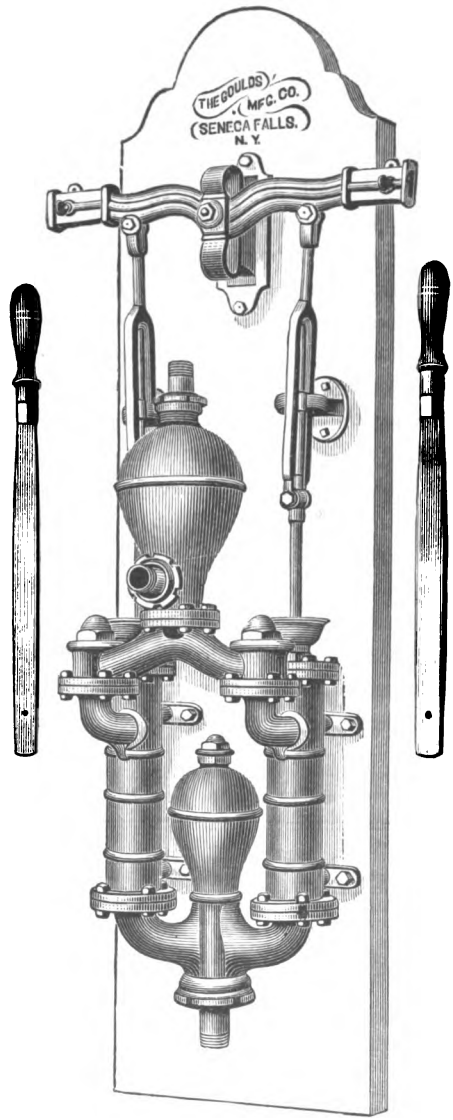
FIG. 469. Sizes, Prices, Etc.

No.	Diameter Cylinders.	Suction and Dis.	Stroke.	Capacity per Rev.	Size Fly Wheel.	IRON.		BRASS.	
						Cipher.	Price.	Cipher.	Price.
2	2½ in.	1½ in.	7 in.	2-7 gal.	24 in.	Gone	$60.00	Gore	$75.00
4	3 "	2 "	7 "	2-5 "	24 "	Gong	75.00	Gorge	110.00
8	4 "	2½ "	8 "	4-5 "	36 "	Good	100.00	Gout	150.00

TWO-CYLINDER FORCE PUMP.

WITH AIR AND VACUUM CHAMBERS, MOUNTED ON PLANK, WITH GUIDE ROD, WROUGHT LEVERS, ETC.

FIG. 468.

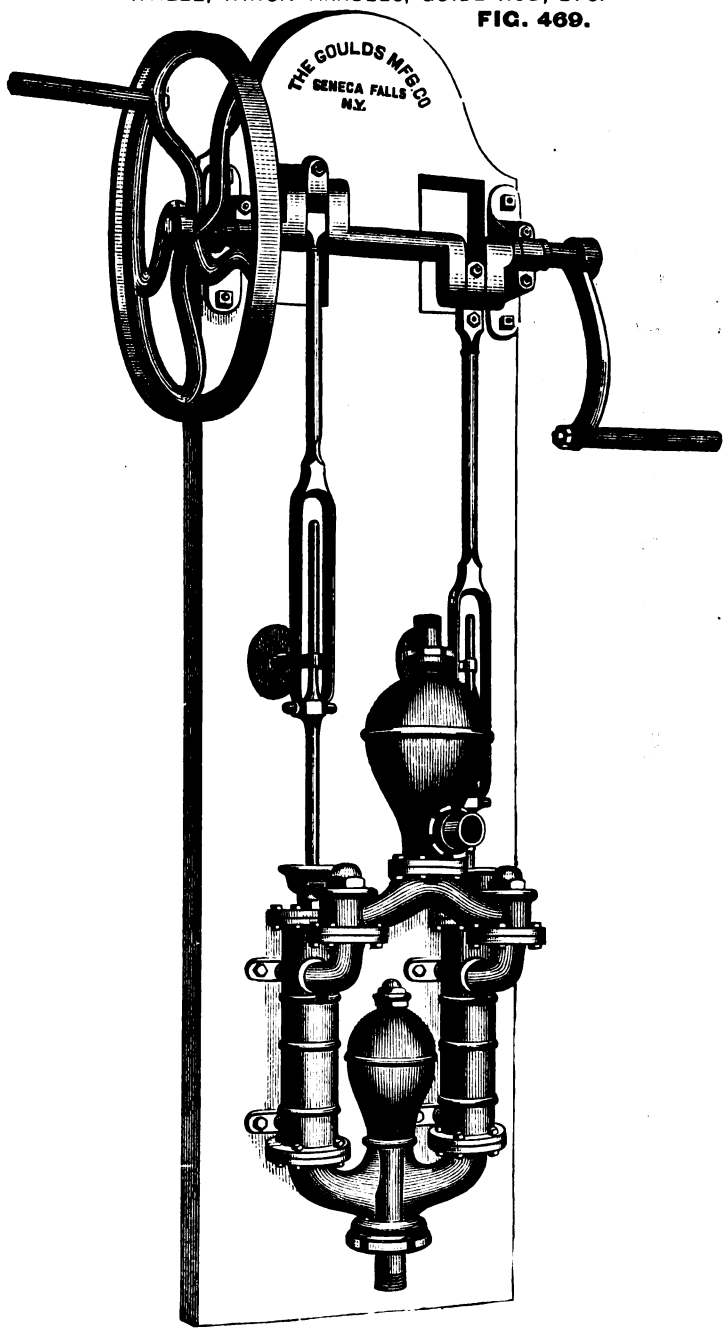


For description and prices, see page 113.

TWO-CYLINDER FORCE PUMP.

WITH AIR AND VACUUM CHAMBERS, MOUNTED ON PLANK, WITH FLY WHEEL, WINCH HANDLES, GUIDE ROD, ETC.

FIG. 469.



For description and prices, see page 113.

NEW RAILROAD FORCE PUMP.

WITH AIR CHAMBER. ARRANGED FOR HAND POWER.

FIG. 278.

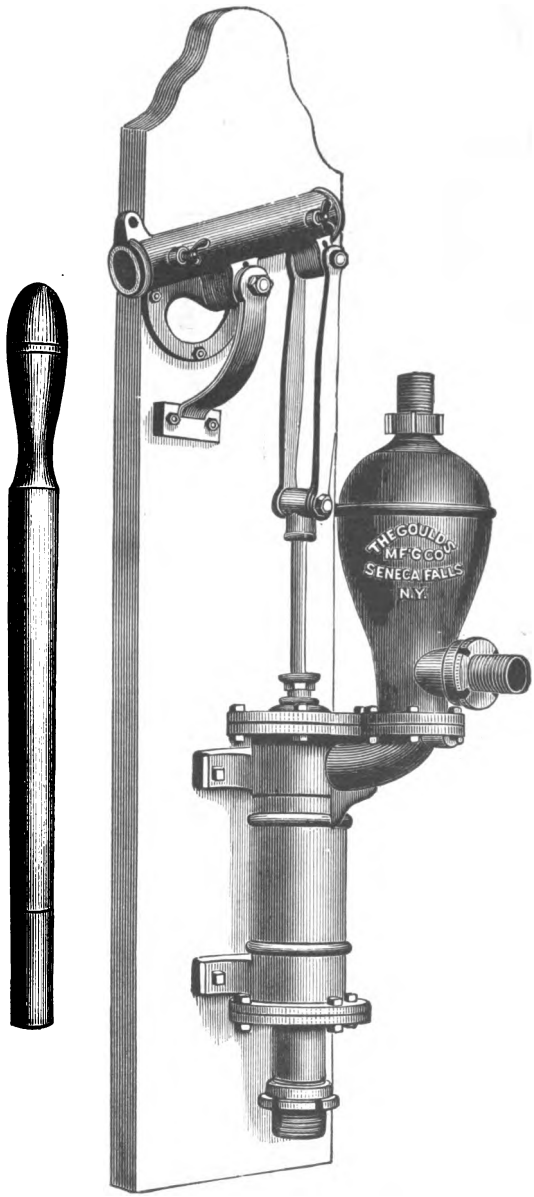


Fig. 278 gives a good representation of a new pattern of Iron Force Pump mounted on plank for hand use. It is extra strong and heavy, fitted with leather valves and packings, and has no equal for forcing water into railroad station tanks, tubs in distilleries, breweries, etc., where one man's power is to be exerted. For pumping hot liquids we fit them with metallic valves and packings. See our remarks on page 7 in relation to pumping hot water. We build three sizes of this admirable Pump.

FIG. 278. Sizes, Prices, Etc.

No.	Diameter Cylinder.	Suction and Discharge.	Stroke.	Capacity per Stroke.	IRON. Cipher.	IRON. Price.	BRASS. Cipher.	BRASS. Price.
8	4 in.	2 in.	8 in.	3-7 gal.	Cynic	$30.00	Dace	$86.00
12	5 "	2½ "	10 "	7-8 "	Dab	40.00	Daft	126.00

Fitted with metallic valves and plungers for pumping hot water add to list $10.00.
We can also supply with cocks when ordered.

NEW RAILROAD FORCE PUMP.

WITH AIR CHAMBER. ARRANGED FOR MACHINE POWER.

FIG. 279.

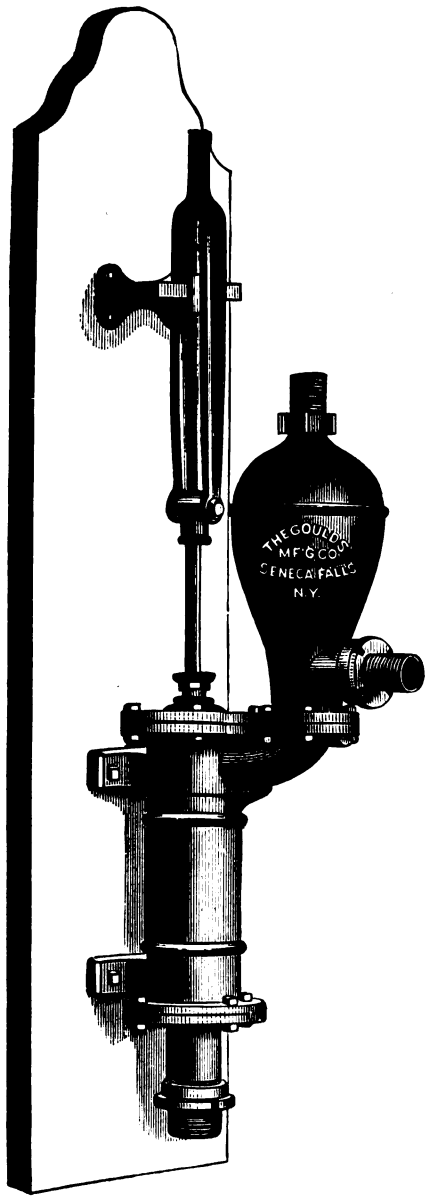


Fig. 279 differs but slightly in construction from Pump on previous page, having the pitman forged with a stub end for connecting to face plate above. The cut gives a truthful idea of these unequaled Pumps as they appear when ready for shipment. We make three sizes.

No.	Diameter Cylinder.	Suction and Discharge.	Stroke.	Capacity per Stroke.	IRON. Cipher.	IRON. Price.	BRASS. Cipher.	BRASS. Price.
8	4 in.	2 in.	8 in.	3-7 gal.	Daily	$30.00	Dale	$86.00
12	5 "	2½ "	10 "	7-8 "	Daisy	40.00	Dame	126.00

FIG. 279. Sizes, Prices, Etc.

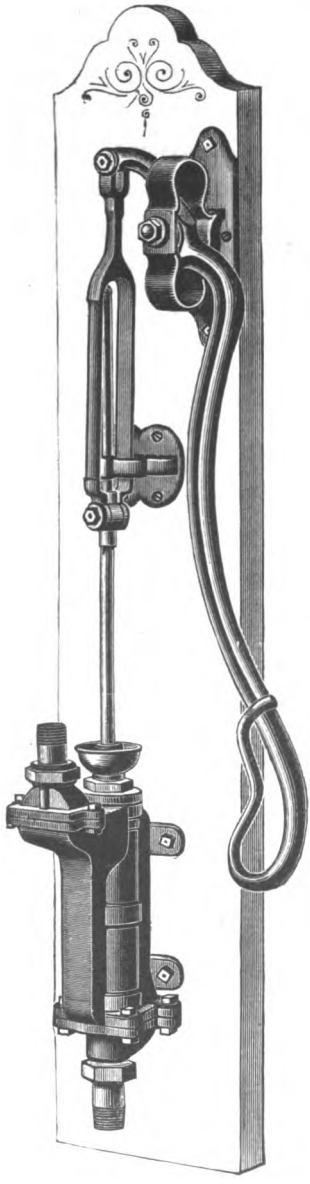
Fitted with metallic valves and plungers for pumping hot water add to list $10.00.

We can fit up these Pumps with cocks if so desired.

DOUBLE ACTING FORCE PUMP.

WITH CHECK VALVE. RIGHT OR LEFT-HANDED.

FIG. 271.



This cut accurately represents one of our well-known Double Acting Force Pumps mounted on plank, with brass piston rod, for house use. In explanation of a Double Acting Pump would say that they lift and force water with both the upward and downward motions of the lever, giving double the quantity of water that a Single Acting Pump of equal size would, and requiring a commensurate outlay of power. They can be worked either right or left-handed, with our reversible fulcrum, and lead or wrought-iron pipe can be used on suction or discharge, but are always fitted for wrought-iron pipe unless otherwise ordered. We make the following sizes in iron or brass:

No.	Diameter Cylinder.	Suction.	Dis.	Stroke.	Capacity per Revolution.	IRON Cipher.	IRON Price.	BRASS. Cipher.	BRASS. Price.
0	2 in.	1¼ in.	1¼ in.	7 in.	1·5 gal.	Clump	$13.50	Comb	$26.00
1	2¼ "	1¼ "	1¼ "	7 "	1·4 "	Coach	14.00	Come	28.00
2	2½ "	1¼ "	1¼ "	7 "	2·7 "	Coast	17.00	Cord	38 00
3	2¾ "	1¼ "	1¼ "	7 "	1·3 "	Coat	19.00	Cork	45.00
4	3 "	1½ "	1¼ "	7 "	2·5 "	Coax	21.00	Corn	52.00
6	3½ "	1½ "	1½ "	8 "	2·3 "	Code	25.00	Couch	69.50
8	4 "	2 "	2 "	8 "	4·5 "	Coil	37.00	Court	94.00
10	4½ "	2½ "	2½ "	8 "	1 "	Coin	50.00	Crack	136.00

Deduct $1.00 from above lists when not mounted on plank.

FIG. 271. Sizes, Prices, Etc.

When these Pumps are fitted for hot water, with brass upper and lower valves, we charge the *net prices* named below in addition:

	IRON.	BRASS.
No. 0,	$2.00	$2.50
No. 1,	2.25	3.00
No. 2,	2.50	3.50
No. 3,	2.50	4.00
No. 4,	$3.00	$5.00
No. 6,	4.00	6.00
No. 8,	6.00	7.00
No. 10,	8.00	9.00

DOUBLE ACTING FORCE PUMP.

WITH AIR CHAMBER, RIGHT OR LEFT-HANDED.

FIG. 272.

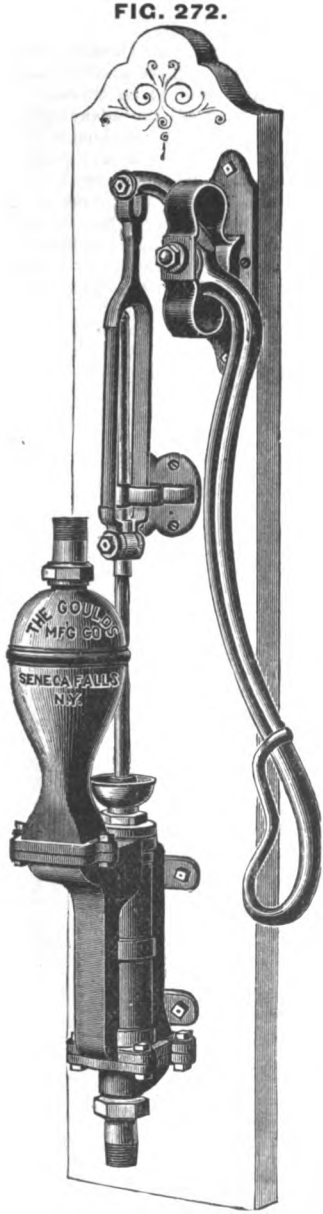


Fig. 272 represents our Double Acting Force Pump mounted on plank with air chamber.

These Pumps are very heavy castings and built in the best possible manner, designed as they are for heavy and constant work. They can be worked either right or left-handed, with our reversible fulcrum, and lead or wrought-iron pipe can be used for the induction and eduction pipes. For heavy lifts above the Pump, we should always urge the use of a Pump with air chamber as a more uniform stream will be secured with this addition.

Always fitted for wrought-iron pipe unless otherwise ordered.

FIG. 272. Sizes, Prices, Etc.

No.	Diameter Cylinder.	Suction.	Discharge	Stroke.	Capacity per Revolution.	IRON. Cipher.	IRON. Price.	BRASS. Cipher.	BRASS. Price.
0	2 in.	1¼ in.	1¼ in.	7 in.	1-5 gal.	Crank	$15.50	Cube	$28.00
1	2¼ "	1¼ "	1¼ "	7 "	1-4 "	Crest	16.00	Cubeb	30.00
2	2½ "	1¼ "	1¼ "	7 "	2-7 "	Crop	19.50	Cubic	40.00
3	2¾ "	1¼ "	1¼ "	7 "	1-3 "	Cross	21.00	Cubit	47.00
4	3 "	1½ "	1½ "	7 "	2-5 "	Croud	23.00	Cue	54.00
6	3½ "	1½ "	1½ "	8 "	2-3 "	Crown	28.50	Cuff	73.00
8	4 "	2 "	2 "	8 "	4-5 "	Crude	42.00	Cull	98.00
10	4½ "	2½ "	2½ "	8 "	1 "	Crush	55.00	Cup	141.00

Deduct $1.00 from list price when not mounted on plank.

Will furnish this Pump with discharges at both the side and top of air chamber if desired, at same list price.

For prices for fitting these Pumps with brass upper and lower valves for hot water use, see page 118.

DOUBLE ACTING FORCE PUMP.

WITH COCK. RIGHT OR LEFT-HANDED.

FIG. 273.

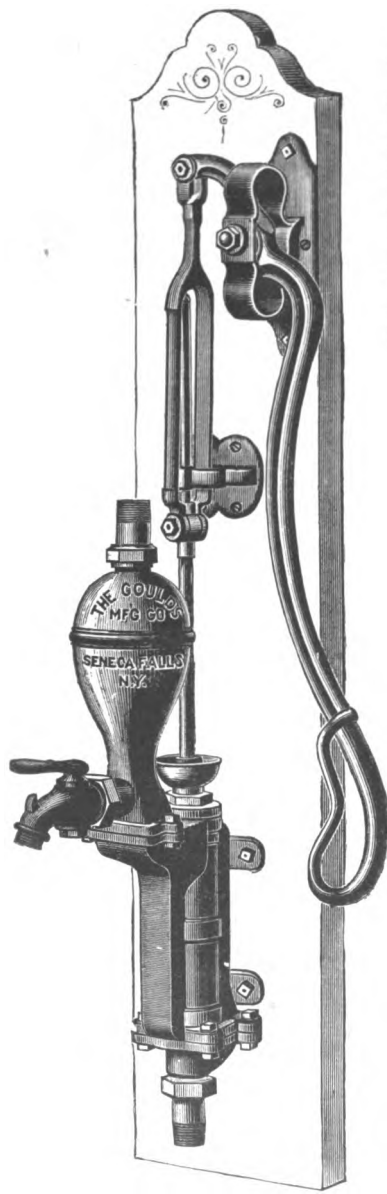


Fig. 273 represents our Double Acting Force Pump delineated on the previous pages, arranged with cock at side of air chamber.

This pump combines all the advantages of the others and in addition is provided with an outlet (by means of cock) at the point of operation. This will be appreciated by all using these Pumps for elevating water to the upper stories of dwellings, as it can be made to serve the double purpose of an ordinary lift Pump as well as a most perfect Force Pump. They can be worked either right or left handed with our reversible fulcrum.

Suction and discharge always fitted for wrought-iron pipe, although either or both of these can be fitted for lead pipe if so ordered.

FIG. 273. Sizes, Prices, Etc.

No.	Diam. Cyl.	Suction.	Dis.	Stroke.	Capacity per Rev.	IRON. Cipher.	IRON. Price.	BRASS. Cipher.	BRASS. Price.
0	2 in.	1¼ in.	1¼ in.	7 in.	1·5 gal.	Verdict	$18.00	Verified	$33.00
1	2¼ "	1¼ "	1¼ "	7 "	1·4 "	Verdigris	18.50	Verifier	35.00
2	2½ "	1¼ "	1¼ "	7 "	2·7 "	Verditer	22.00	Verify	45.00
3	2¾ "	1¼ "	1¼ "	7 "	1·3 "	Verdure	23.50	Verily	52.00
4	3 "	1½ "	1¼ "	7 "	2·5 "	Verecund	25.50	Verity	59.00
6	3½ "	1½ "	1½ "	8 "	2·3 "	Verge	31.00	Verjuice	78.00
8	4 "	2 "	2 "	8 "	4·5 "	Verger	45.00	Vermes	103.00
10	4½ "	2½ "	2½ "	8 "	1 "	Verging	58.00	Vermilion	146.00

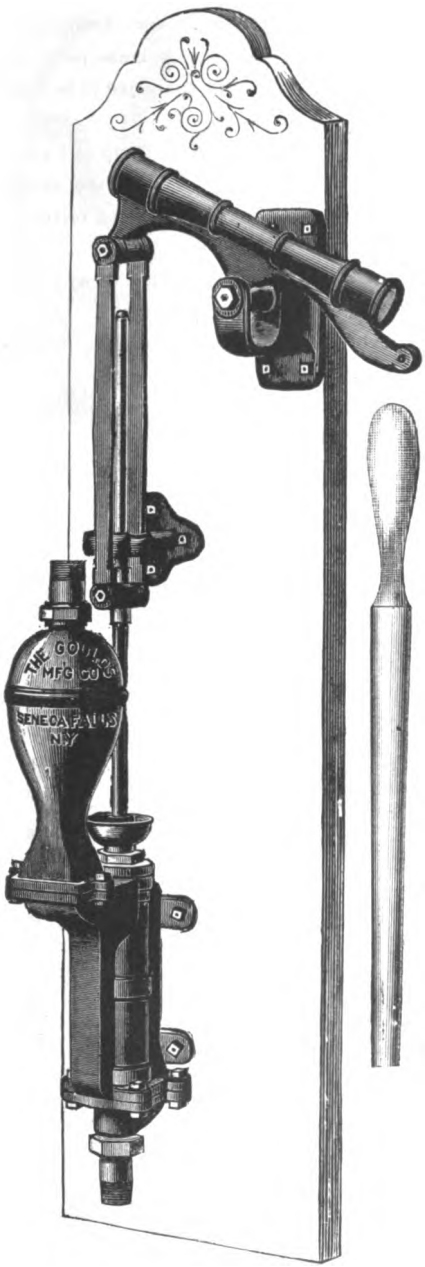
Deduct $1.00 from list when not mounted on plank.

For prices for fitting these Pumps with brass upper and lower valves for hot water use, see page 118.

DOUBLE ACTING FORCE PUMP.

MOUNTED ON PLANK, WITH WOODEN LEVERS. FOR HAND POWER.

FIG. 451.



This cut accurately represents our Double Acting Force Pump, mounted on plank, with brass piston rod, arranged to be worked by wooden levers. This is a pump of large capacity and capable of doing severe work, being built with that idea especially in view. We have, on previous pages in this book, said all that is necessary concerning this style of Pump, to which reference can be made. Always fitted for wrought-iron pipe, unless otherwise ordered.

FIG. 451. Sizes, Prices, Etc.

No.	Diameter Cylinder.	Suction.	Dis.	Stroke.	Capacity per Rev.	IRON. Cipher.	IRON. Price.	BRASS. Cipher.	BRASS. Price.
2	2½ in.	1¼ in.	1¼ in.	7 in.	2-7 gal.	Fusil	$22.00	Gaily	$40.00
3	2¾ "	1¼ "	1¼ "	7 "	1-3 "	Fuss	23.50	Gain	47.00
4	3 "	1½ "	1¼ "	8 "	2-5 "	Gable	25.00	Gale	52.00
6	3½ "	1½ "	1½ "	8 "	2-3 "	Gad	30.00	Gall	74.00
8	4 "	2 "	2 "	8 "	4-5 "	Gaff	44.00	Game	99.00
10	4½ "	2½ "	2½ "	8 "	1 "	Gage	58.00	Gang	142.00

We can furnish double discharge air chamber at same list price, and also supply cocks to be used with same at an additional cost.

For prices of brass upper and lower valves see page 118.

DOUBLE ACTING FORCE PUMP.

MOUNTED ON PLANK WITH PITMAN AND GUIDE FOR POWER

FIG. 452.

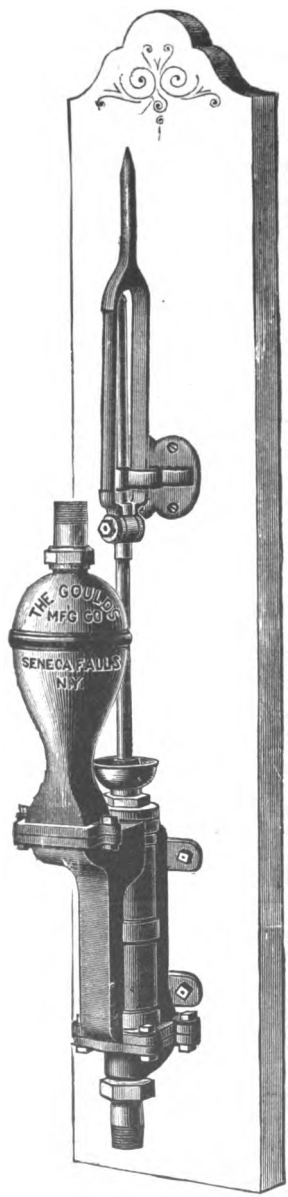


Fig. 452 represents our Double Acting Force Pump, mounted on plank, with brass piston rod, arranged with stub end to be connected to face plate above.

It is the same style and class of Pump as Figs. 271 and 272, described on pages 118 and 119, and like them furnished ordinarily with leather valves and packings.

When wanted for pumping hot liquids we fit them with metallic valves and packing at an extra charge. Always fitted for wrought-iron pipe unless ordered otherwise.

Air chamber with two outlets at same list price.

FIG. 452. Sizes, Prices, Etc.

No.	Diameter Cylinder.	Suction.	Discharge	Stroke.	Capacity per Revolution.	IRON. Cipher.	IRON. Price.	BRASS. Cipher.	BRASS. Price.
0	2 in.	1¼ in.	1¼ in.	7 in.	1-5 gal.	Gape	$17.50	Gavel	$30.00
1	2¼ "	1¼ "	1¼ "	7 "	1-4 "	Garb	19.00	Gavit	34.00
2	2½ "	1¼ "	1¼ "	7 "	2-7 "	Gash	21.00	Gay	39.00
3	2¾ "	1¼ "	1¼ "	7 "	1-3 "	Gasp	23.00	Gaze	46.00
4	3 "	1½ "	1¼ "	7 "	2-5 "	Gate	25.00	Gear	52.00
6	3½ "	1½ "	1½ "	8 "	2-3 "	Gaunt	30.00	Gem	74.00
8	4 "	2 "	2 "	8 "	4-5 "	Gauze	44.00	Gent	99.00
10	4½ "	2½ "	2½ "	8 "	1 "	Gave	58.00	Genus	142.00

For prices for brass upper and lower valves for pumping hot liquids see page 118.

DOUBLE ACTING FORCE PUMP, WITH FLY WHEEL.

MOUNTED ON PLANK, WITH CRANK SHAFT AND WINCH HANDLES.

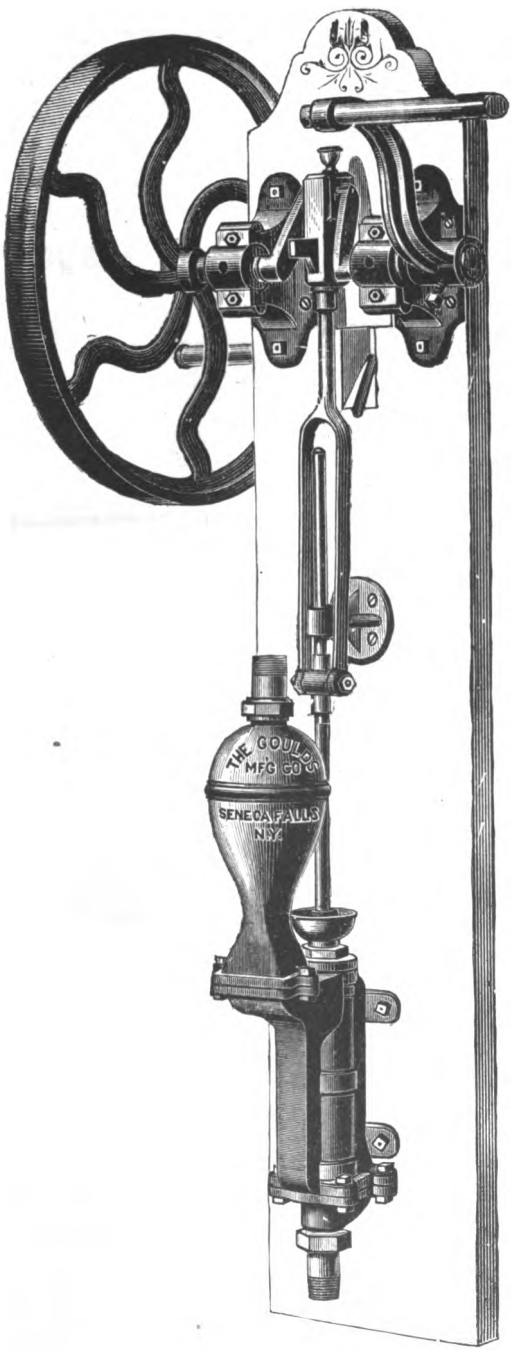


FIG. 450.

The cut represents accurately our Double Acting Force Pump, with fly wheel, mounted on plank, with steel crank shaft, etc.

Where the quantity of water is so great as to require working a pump for long periods at a time, one supplied with the appliances suggested by the cut will be found to operate with far less fatiguing labor than the ordinary Pump — for the fly wheel once set in motion greatly assists by its momentum to carry the piston over the centres.

We can furnish an air chamber with two outlets, if desired, at same list price.

FIG. 450. Sizes, Prices, Etc.

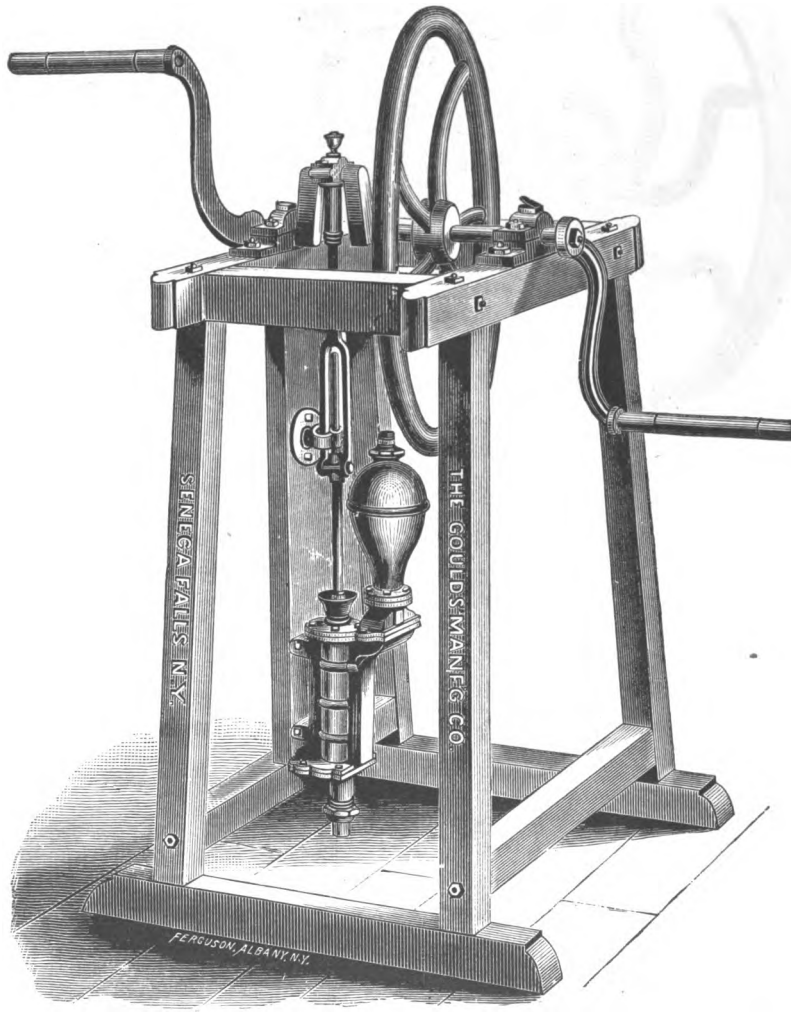
No.	Diameter Cylinder.	Suction.	Discharge	Stroke.	Capacity per Revolution.	IRON. Cipher.	IRON. Price.	BRASS. Cipher.	BRASS. Price.
2	2½ in.	1¼ in.	1¼ in.	7 in.	2-7 gal.	Full	$40.00	Furry	$61.00
3	2¾ "	1¼ "	1¼ "	7 "	1-3 "	Fume	42.00	Furl	68.00
4	3 "	1½ "	1¼ "	7 "	2-5 "	Fun	45.00	Fury	75.00
6	3½ "	1½ "	1½ "	7½ "	3-5 "	Fund	55.00	Furze	94.00
8	4 "	2 "	2 "	7½ "	4-5 "	Fur	65.00	Fuse	119.00
10	4½ "	2½ "	2½ "	7½ "	1 "	Furs	80.00	Furzy	135.00

For prices for brass upper and lower valves see page 118.

SUCTION AND FORCE PUMP.

MOUNTED ON WOOD FRAME, WITH HEAVY FLY WHEEL, CRANK SHAFT AND WINCH HANDLES.

FIG. 655.



The above Pump (although not so shown in cut) is the same size and capacity as our Fig. 272, shown and described on page 119, and an appliance very often desired for filling tanks, reservoirs, etc. From two to four men can work on the Pump. When parties desire to make the wood frame themselves, we will furnish the Pump, fly wheel, shaft, boxes, etc., at a reduction in list price.

See opposite page for sizes and prices.

SINGLE ACTING SUCTION AND FORCE PUMP.

FIG. 655. Sizes, Prices, Etc.

No.	Diam. Cylinder	Suction and Dis.	Capacity per Stroke.	WITH CHECK VALVE.				WITH AIR CHAMBER.			
				Cipher.	Iron.	Cipher.	Brass.	Cipher.	Iron.	Cipher.	Brass.
2	2½ in.	1¼ in.	1-7 gal.	Rebut	$54.00	Reek	$65.00	Reign	$56.00	Remit	$67.00
3	2¾ "	1¼ "	1-6 "	Reck	55.00	Reel	70.00	Rein	57.00	Rend	72.00
4	3 "	1¼ "	1-5 "	Red	60.00	Refer	75.00	Relax	62.50	Renew	77.50
5	3¼ "	1½ "	1-4 "	Redan	60.00	Refit	80.00	Relay	62.50	Rent	82.50
6	3½ "	1½ "	3-10 "	Reed	65.00	Reft	100.00	Relic	68.00	Repay	103.00
8	4 "	2 "	2-5 "	Reef	75.00	Regal	115.00	Rely	79.00	Repel	119.00

DOUBLE ACTING SUCTION AND FORCE PUMP.

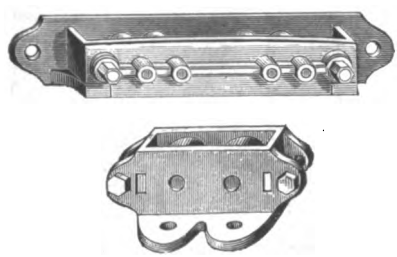
FIG. 656. Sizes, Prices, Etc.

No.	Diam. Cylinder	Suction and Dis.	Capacity per Rev.	WITH CHECK VALVE.				WITH AIR CHAMBER.			
				Cipher.	Iron.	Cipher.	Brass.	Cipher.	Iron.	Cipher.	Brass.
1	2¼ in.	1¼ in.	1-4 gal.	Lode	$54.00	Loft	$66.00	Log	$56.00	Loin	$68.00
2	2½ "	1¼ "	2-7 "	Reply	55.00	Rich	70.00	Rifle	57.00	Rill	72.00
3	2¾ "	1¼ "	1-3 "	Rest	56.00	Rick	75.00	Rift	58.50	Rim	77.50
4	3 "	1½ "	2-5 "	Revel	60.00	Ride	80.00	Rig	63.00	Rind	83.00
6	3½ "	1½ "	2-3 "	Rhyme	70.00	Rider	110 00	Right	74.00	Ring	114.00
8	4 "	2 "	4-5 "	Rib	90.00	Ridge	114.00	Rigid	95.00	Rinse	119.00

SINGLE AND DOUBLE ROLLER GUIDES.

FOR PISTON RODS.

FIG. 516.



Single Roller Guides for ⅝ or ¾ inch rods, ... $1.15
" " " for ⅞ " 1.56
" " " for 1 or 1⅛ " 2.45
" " " for 1¼ " 3.25
Double Roller Guides for ⅝ or ¾ " 4.88

WELL ROD JOINT AND BRASS BUSH.

FIG. 515.

⅝ inch, each, ...	$1.20	⅞ inch, each, ...	$1.75
¾ "	1.38	1 "	2.45

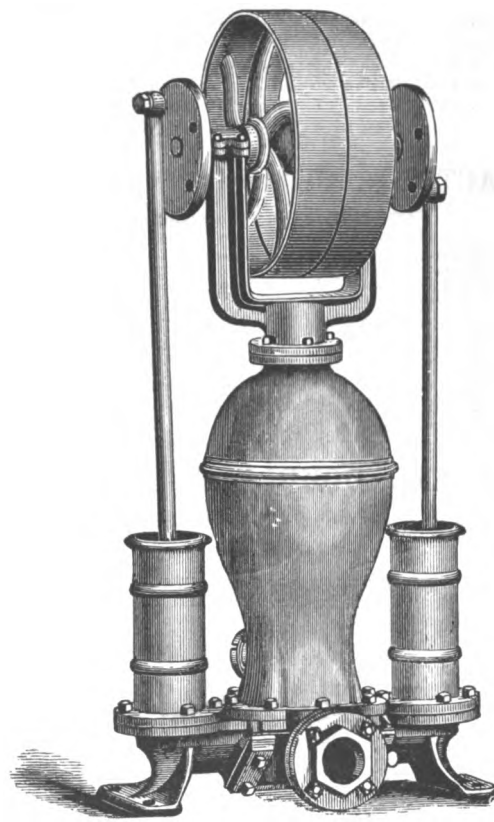
WELL ROD JOINT AND BRASS BUSH IN 12-FOOT LENGTHS.

⅝ inch, per foot, ...	$0.20	⅞ inch, per foot, ...	$0.33
¾ " "	.22	1 " "	.42

TWO-CYLINDER POWER DECK PUMP.

FOR STEAMBOATS, WHARVES, ETC.

FIG. 457.



The above cut shows one of our Open Top Two-Cylinder Force Pumps described on page 166, surmounted with a tight and loose pulley to be run by a belt. On shipboard this is found very convenient for washing decks, or in case of fire makes an efficient engine. We construct two sizes of these Pumps with pulleys, as shown in the cut.

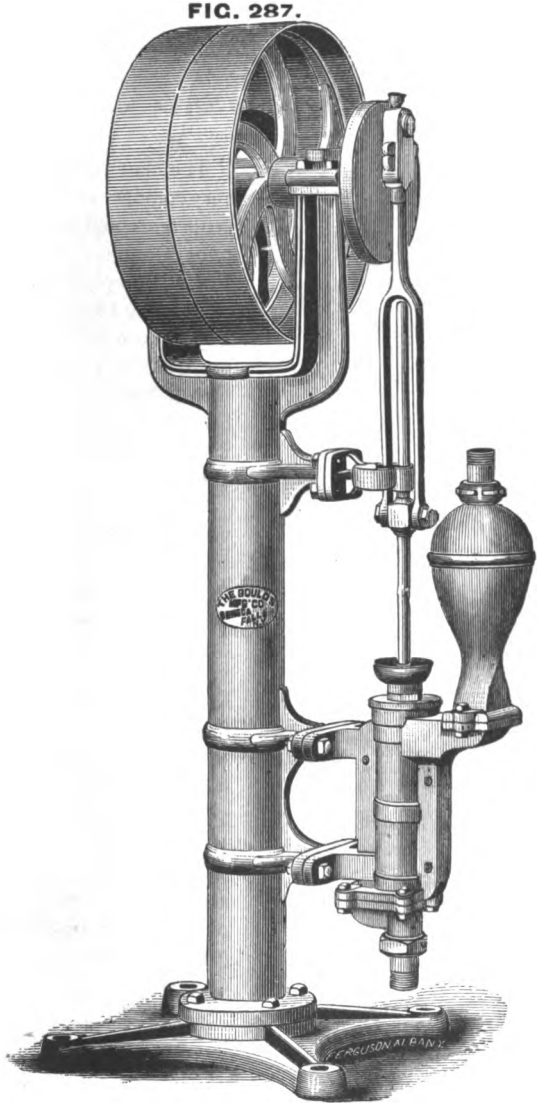
FIG. 457. Sizes, Prices, Etc.

No.	Diameter Cylinder.	Suction.	Discharge.	Stroke.	Capacity per Rev.	IRON.		BRASS.	
						Cipher.	Price.	Cipher.	Price.
8	4 in.	2½ in.	2 in.	8 in.	4-5 gal.	Gimp	$90.00	Live Loaf	$105.00
12	5 "	2½ "	2 "	8 "	11-3 "	Gipsy	105.00		130.00

DOUBLE ACTING FORCE PUMP ON COLUMN.

WITH AIR CHAMBER. ARRANGED WITH TIGHT AND LOOSE PULLEYS.

FIG. 287.



We put five sizes of Double Acting Force Pumps on column. Fitted for lead and iron-pipe connections as ordered.

For Double Acting Force Pump, without air chamber, on column, deduct $5.00 in list on first two sizes, $10.00 on third, and $15.00 on last two sizes.

For fuller description of this column see next page.

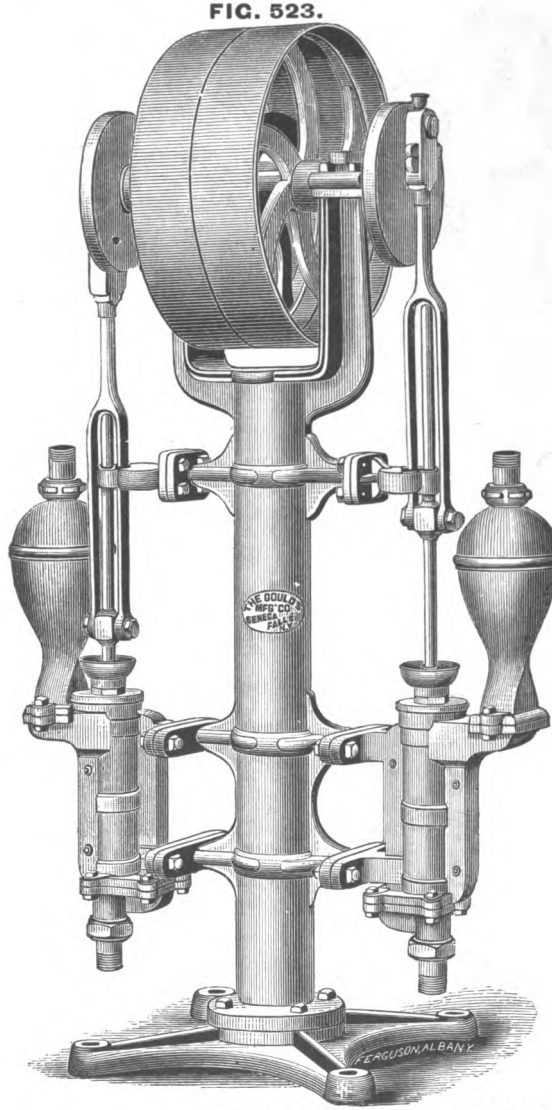
FIG. 287. Sizes, Prices, Etc.

No.	Diameter Cylinder.	Suction.	Dis.	Stroke.	Capacity per Rev.	IRON.		BRASS.	
						Cipher.	Price.	Cipher.	Price.
2	2½ in.	1¼ in.	1¼ in.	7 in.	2-7 gal.	Dense	$ 75.00	Desk	$ 89.00
4	3 "	1½ "	1¼ "	7 "	2-5 "	Deny	85.00	Deuce	106.00
6	3½ "	1½ "	1½ "	8 "	2-3 "	Depot	100.00	Dew	144.00
8	4 "	2 "	2 "	8 "	4-5 "	Depth	120.00	Dial	182.00
10	4½ "	2½ "	2½ "	8 "	1 "	Dern	140.00	Diary	224.00

TWO DOUBLE ACTING FORCE PUMPS ON COLUMN.

WITH AIR CHAMBERS, TIGHT AND LOOSE PULLEYS, FACE PLATES AND SOLID BRASS PISTON RODS.

FIG. 523.



The cut shows a very compact and powerful combination of two Double Acting Force Pumps, bolted to a strong heavy cast-iron column, which can be quickly set by merely leveling up the bed plate and bolting it to the floor or suitable timbers.

The pulleys are provided with set screws, so that both can be made fast to the crank shaft, if necessary, to drive the Pumps.

For Force Pumps, without air chamber, deduct $10.00 in list on first two sizes, $20.00 on the third, and $30.00 on last two sizes.

These Pumps are always fitted for iron pipe, but can be fitted for lead pipe, if so ordered.

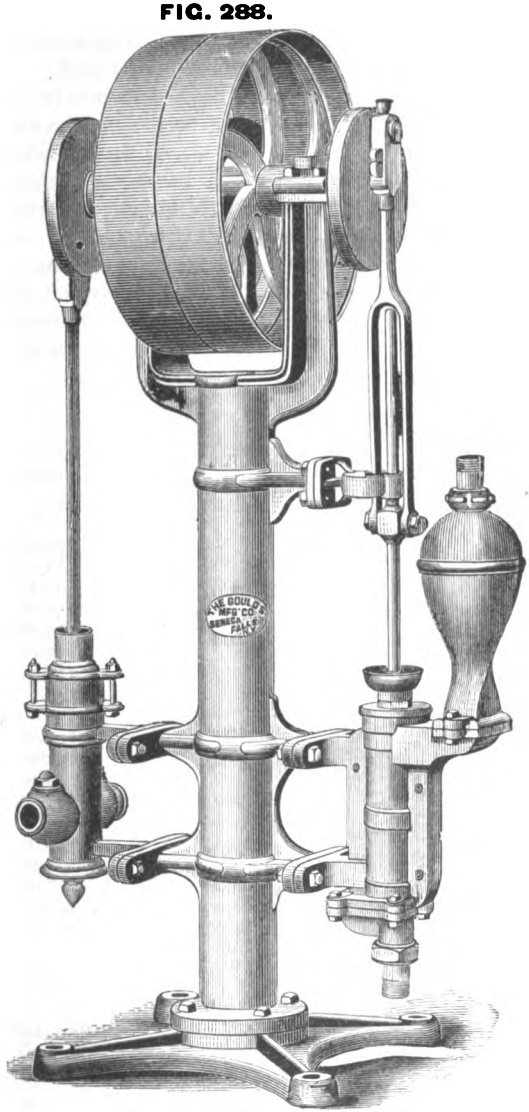
FIG. 523. Sizes, Prices, Etc.

No.	Diameter Cylinder.	Suction.	Dis.	Stroke.	Capacity per Rev.	IRON.		BRASS.	
						Cipher.	Price.	Cipher.	Price.
2	2½ in.	1¼ in.	1¼ in.	7 in.	4-7 gal.	Idol	$ 95.00	Ivy	$123.00
4	3 "	1½ "	1¼ "	7 "	4-5 "	Ire	110.00	Jack	152.00
6	3½ "	1½ "	1½ "	8 "	1 1-3 "	Iron	140.00	Jade	228.00
8	4 "	2 "	2 "	8 "	1 3-5 "	Isle	175.00	Jag	289.00
10	4½ "	2½ "	2½ "	8 "	2 "	Item	205.00	Jam	373.00

DOUBLE ACTING FORCE PUMP AND BOILER PUMP, ON COLUMN.

ARRANGED WITH TIGHT AND LOOSE PULLEYS.

FIG. 288.



This is a complete combination of a Tank and Boiler Feed Pump fastened to one column with heavy bed plate. The facility with which they can be put into operation commends them to any one in want of such Pumps.

FIG. 288. Sizes, Prices, Etc.

BOILER PUMP.				DOUBLE ACTING FORCE PUMP.				COMPLETE.	
Diameter Cylinder.	Stroke.	Suction and Dis.	Capacity per Stroke.	Diam. Cyl.	Stroke.	Suction and Dis.	Capacity per Revolution.	Cipher.	Price.
2½ in.	6 in.	1¼ in.	1-8 gal.	3 in.	7 in.	1½ in.	2-5 gal.	Dice	$130.00
2½ "	6 "	1¼ "	1-8 "	4 "	8 "	2 "	4-5 "	Didst	165.00

For Force Pumps without A. C., deduct $5.00 on list on first size and $15.00 on the last size.

"STAR" DOUBLE ACTING RAILROAD FORCE PUMP.

Figs. 338 and 339 represent a new style of Double Acting Force Pump, very strong and powerful, and especially designed for the use of distilleries, mills, railroad companies, or other parties who want to raise a large quantity of water, and desire a good Pump with which to accomplish it.

In making Pumps we have always striven to get a design that would please the eye, and this Pump is no exception. The Cylinders are all bored equal to any steam engine Cylinder. The piston rod is of bronze, with solid cross head.

The valves are a superior variety of the poppet valve, which is known to be the best and most efficient valve in use. The valve seats are of bronze and screwed in, and can at any time be removed and replaced by new ones, by simply taking off the cover, or plate, from the valve box, in which are all the valves, without disturbing any other part of the Pump. Each valve, itself of bronze, has a rubber facing, rendering it perfectly tight, besides relieving all that pounding and jar so detrimental to Pumps with metallic valves. The suction and discharge pipes can also be attached or detached without any trouble, as all the connections are in plain sight on the front of the Pump. It will be readily observed this Pump has the element of a successful hydraulic engine in its composition, and we will stake OUR reputation on its being the best Pump of its kind in the market.

FIG. 339. Sizes, Prices, Etc.

Diameter Cylinder.	Stroke.	Suction and Discharge.	Capacity per Revolution.	IRON.		BRASS-LINED CYLINDER.	
				Cipher.	Price.	Cipher.	Price.
3 in.	8 in.	1½ in.	1-2 gal.	Educt	$65.00	Elder	$72.00
4 "	8 "	2 "	7-8 "	Eel	75.00	Elect	82.00
5 "	8 "	2½ "	1 1-3 "	Egg	90.00	Elf	97.50
6 "	8 "	3 "	2 "	Eider	120.00	Elite	130.00
4 "	10 "	2 "	1 "	Eight	95.00	Elk	105.00
3 "	12 "	1½ "	3-4 "	Eject	78.00	Ell	90.00
4 "	12 "	2 "	1 1-3 "	Eke	101.00	Elm	115.00
5 "	12 "	2½ "	2 "	Eland	120.00	Elogy	135.00
5 "	15 "	2½ "	2 1-2 "	Elate	135.00	Elong	150.00
5 "	18 "	2½ "	3 "	Elapse	170.00	Elastic	180.00
6 "	14 "	3 "	3 1-3 "	Elbow	175.00	Elope	190.00
6 "	18 "	3 "	4 1-3 "	Eld	225.00	Elsen	250.00
7 "	12 "	4 "	4 "	Elderly	210.00	Eldern	235.00
7 "	14 "	4 "	4 2-3 "	Elding	225.00	Eldorado	250.00
7 "	18 "	4 "	6 "	Eldrich	250.00	Elasticity	280.00
8 "	12 "	5 "	5 1-4 "	Election	300.00	Elector	330.00
8 "	15 "	5 "	6 1-2 "	Electric	340.00	Elective	375.00
8 "	18 "	5 "	7 4-5 "	Elegant	400.00	Elegist	440.00
8 "	24 "	5 "	10 2-5 "	Elegiac	450.00	Element	500.00

Fig. 339 can be fitted with forked rod, for attaching to wood rod of Wind Mill, at $2.50 extra list.

To get above results, Pumps must be operated to full length of stroke, and even then allowance should be made for wear of plunger leathers, etc. The following may be regarded as a sort of guide for working these Pumps.

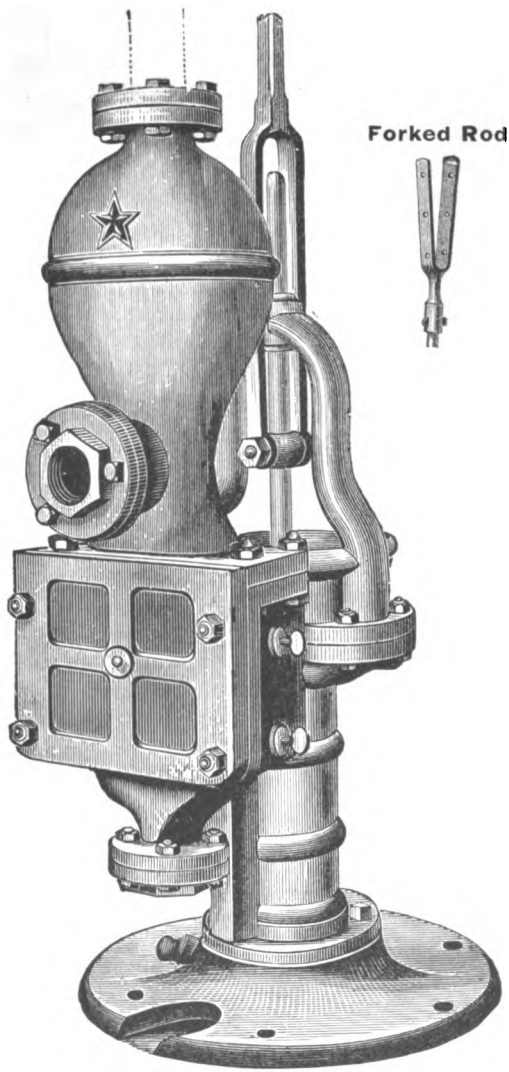
8	inch	stroke	Pumps,	50 to 60	revolutions	per minute.
10 and 12	"	"	"	35 to 40	"	"
14 and 15	"	"	"	30 to 35	"	"
18	"	"	"	25 to 30	"	"

All our Pumps have gun-metal piston rods.

"STAR" DOUBLE ACTING RAILROAD FORCE PUMP.

FOR MACHINE POWER.

FIG. 339.

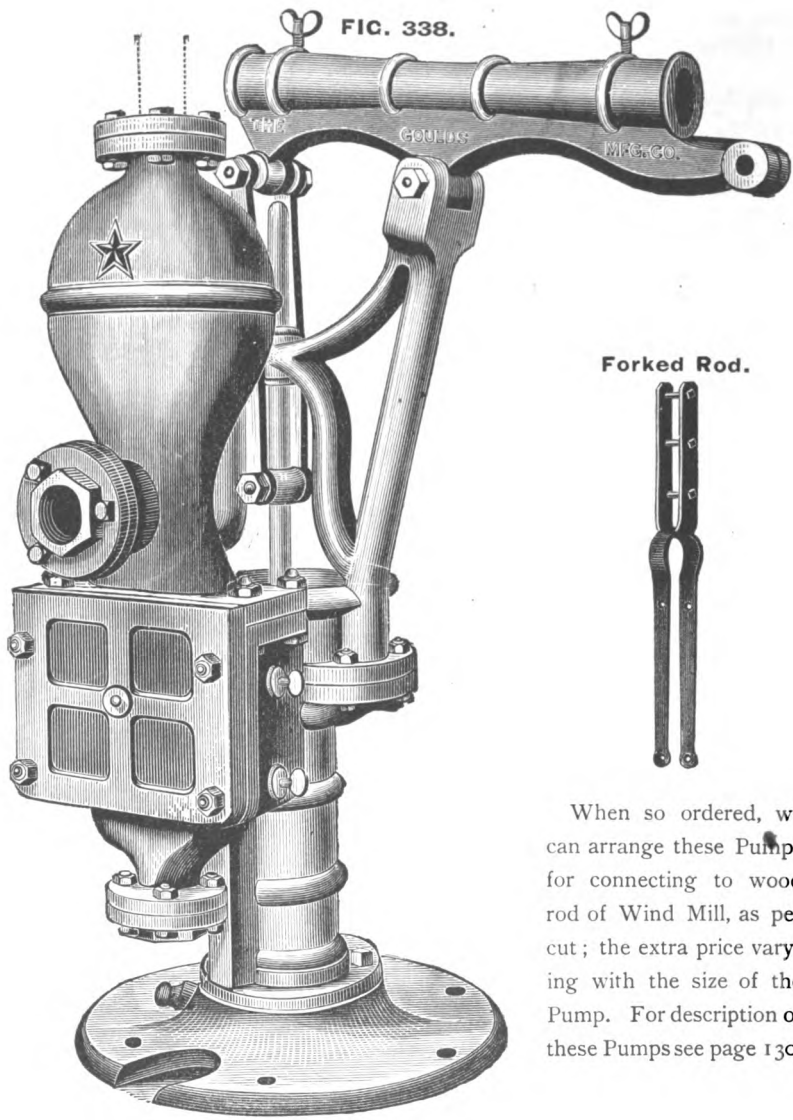


For description and prices see opposite page. These Pumps are often used with Wind Mills where large quantities of water are desired to be raised.

"STAR" DOUBLE ACTING RAILROAD FORCE PUMP.

FOR HAND POWER.

FIG. 338.



Forked Rod.

When so ordered, we can arrange these Pumps for connecting to wood rod of Wind Mill, as per cut; the extra price varying with the size of the Pump. For description of these Pumps see page 130.

FIG. 338. Sizes, Prices, Etc.

Diameter Cylinder.	Stroke.	Suction and Discharge.	Capacity per Revolution.	IRON.		BRASS-LINED CYLINDER.	
				Cipher.	Price.	Cipher.	Price.
3 in.	8 in.	1½ in.	1-2 gal.	Ebon	$ 65.00	Edge	$ 72.00
4 "	8 "	2 "	7-8 "	Echo	75.00	Edict	82.00
5 "	8 "	2½ "	1 1-3 "	Eddy	90.00	Edify	97.50
6 "	8 "	3 "	2 "	Edend	120.00	Edited	130.00

"METEOR" HAND AND POWER PUMPS.

FOR RAILROADS, FACTORIES, WAREHOUSES, WIND MILLS, ETC.

The "Meteor" is a new Double Acting Pump, and one that we can sell some cheaper than our "Star," Figs. 338 and 339; not because the workmanship is in any degree inferior, but because it is not so heavy, and is made entirely of cast and wrought iron, instead of cast iron and gun metal, as is the case with the latter. The surfaces of all the joints in this Pump are broad enough for ample packings, and are planed off their entire width, thus securing perfect water and air-tight joints. The essential difference between these Pumps is in the valves. In the "Star" the seats and valves both are gun metal, while in the "Meteor" the valves are of the leather flap variety. They can be readily laid bare by removing the plate in front, held in its place by one large nut, and repaired or cleaned without disturbing the connecting pipes at all. Draw off plugs of brass are located in proper parts of the Pump, while a priming plug, at the side of the Valve Box, affords easy opportunity for supplying water if the Pump has "lost" it. The Pumps can be fitted with forked pitman for wood-rod connection at the usual charge named below.

FIG. 682. Sizes, Prices, Etc.

Diameter Cylinder.	Stroke.	Suction and Discharge.	Capacity per Revolution.	IRON.	
				Cipher.	Price.
2½ in.	8 in.	1½ in.	1-4 gal.	Rush	$45.00
3 "	8 "	1½ "	1-2 "	Rusk	55.00
4 "	8 "	2 "	7-8 "	Rut	65.00
5 "	8 "	2½ "	1 1-3 "	Rusty	90.00

FIG. 683. Sizes, Prices, Etc.

Diameter Cylinder.	Stroke.	Suction and Discharge.	Capacity per Revolution.	IRON.	
				Cipher.	Price.
2½ in.	8 in.	1½ in.	1-4 gal.	Sabre	$45.00
3 "	8 "	1½ "	1-2 "	Sack	55.00
3 "	12 "	1½ "	3-4 "	Sad	60.00
4 "	8 "	2 "	7-8 "	Safe	65.00
4 "	12 "	2 "	1 1-4 "	Sag	82.50
5 "	8 "	2½ "	1 1-3 "	Sage	90.00
5 "	12 "	2½ "	2 "	Sags	95.00

Add $2.50 to list prices when ordered with Forked Rod for connecting to Wind Mill.

Above computations of capacity are based on pump being worked its full stroke. The speed at which these Pumps should be operated, depends on the diameter and the length of stroke; but we can offer, as a general rule of practice, the following:

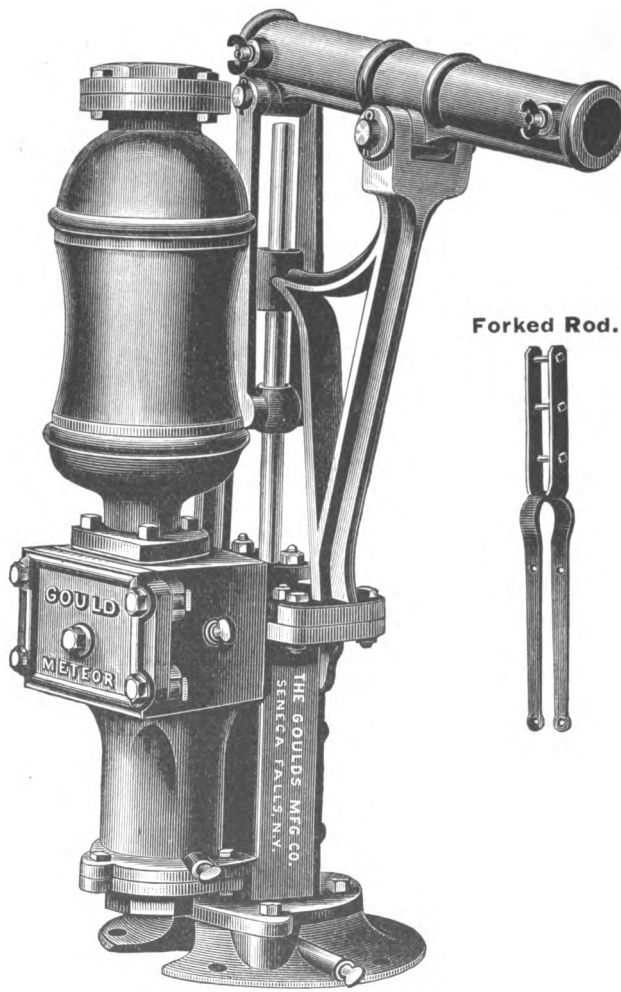
8 inch stroke Pumps, ... 50 to 60 revolutions per minute.
12 " " . . . . . 35 to 40 " "

☞See following pages for cuts of these Pumps.

"METEOR" DOUBLE ACTING FORCE PUMP.

FOR HAND POWER.

FIG. 682.



See page 133 for description and prices.

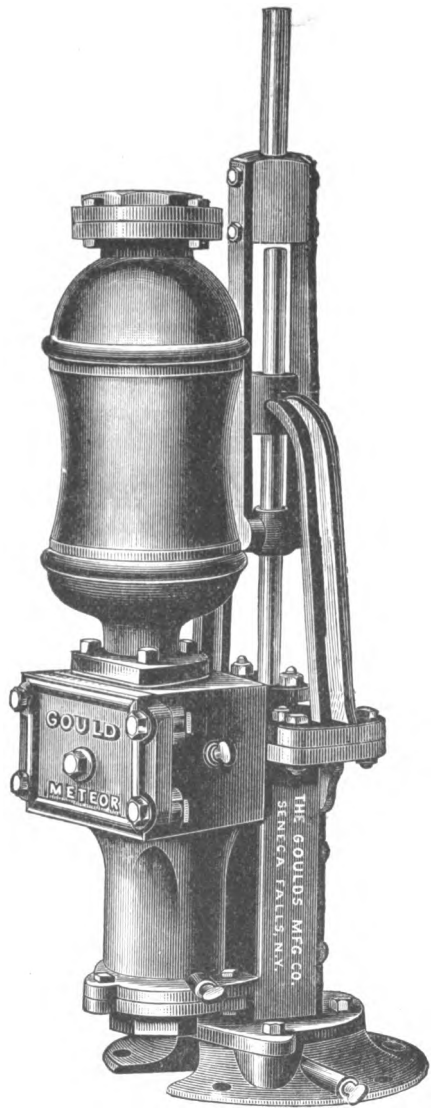
When so ordered we can arrange these Pumps for connecting to wood rod of Wind Mill, as per cut; the extra price varying with the size of Pump.

"METEOR" DOUBLE ACTING FORCE PUMP.

FOR MACHINE POWER.

FIG. 683.

Forked Rod.

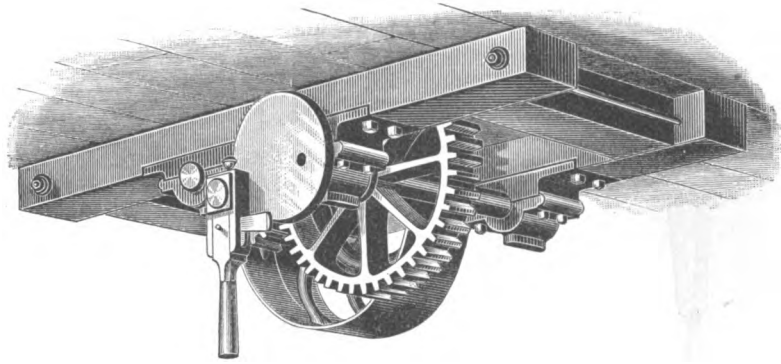


See page 133 for description and prices.

COUNTER SHAFT AND FACE PLATE.

WITH BACK GEARING.

FIG. 650.



The above cut represents one of several styles of Counter Shafts which we manufacture for operating power Pumps. These can be used with our Figs. 279, 452, 339, 683, etc. It is necessary, in order to determime the size Counter Shaft required, that we should know the size of the Pump and the work it is to perform.

The No. 2 is mounted on heavy oak frame and is very heavy and strong. We can make Counter Shafts of this description of any size, according to the work required.

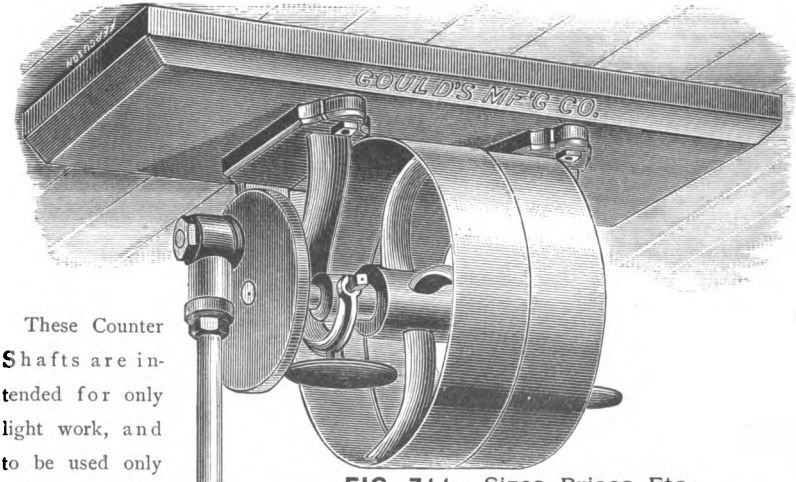
FIG. 650. Sizes, Prices, Etc.

No.	Diameter Large Gear.	Diameter Small Gear.	Face of Gear.	Diameter of Pulleys.	Face of Pulleys.	Cipher.	Price.
1	12 in.	4 in.	2½ in.	16 in.	4 in.	Beat	$ 50.00
2	22 "	7¾ "	3½ "	22 "	5½ "	Beef	125.00

COUNTER SHAFT AND FACE PLATE.

WITH BEARINGS.

FIG. 711.



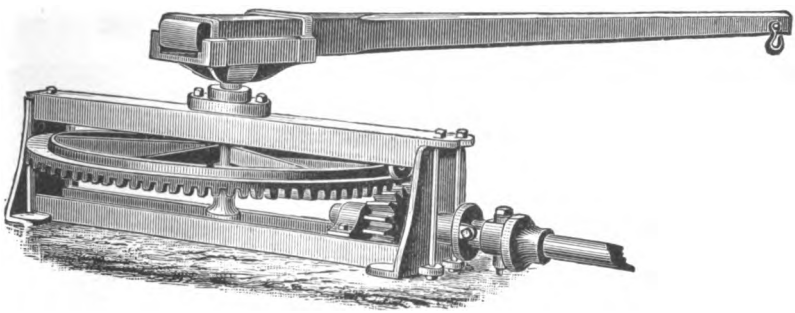
These Counter Shafts are intended for only light work, and to be used only with our smaller Pumps.

FIG. 711. Sizes, Prices, Etc.

No.	Dia. of Pulleys.	Face of Pulleys.	Cipher.	Price.
1	16 in.	3½ in.	Syrup	$30.00
2	18 "	4 "	Sythe	35.00
3	22 "	5 "	Table	45.00

IRON HORSE POWER.

FIG. 597.



This cut shows a very simple though thoroughly constructed Horse Power for driving Pumps or any kind of agricultural machinery. We furnish it as shown in cut, including the universal joint with stub end to weld to the horizontal shaft. We can supply the driving shaft, face plate, pitman, boxes, etc., for driving Pumps, if ordered. The following tables will furnish an accurate idea of the relative strength and worth of the different Horse Powers. The tongue is made of hard wood and is ten feet long.

FIG. 597. Sizes, Prices, Etc.

	Weight complete.	Diam. Large Wheel.	No. Teeth.	Diameter Pinion.	No. Teeth.	Size Frame.	Cipher.	Price.
1 horse power,	333lbs.	31 in.	91	4⅝ in.	14	38 x 12 in. 10 in. high	Miry	$55.00
2 " "	802 "	38½ "	97	6⅜ "	16	48 x 32 in. 13 in. high	Miss	120.00

See following pages for cuts of our Horse Power as used over wells.

IRON HORSE POWER.

WITH DOUBLE ACTING FORCE PUMP—FOR DEEP WELLS.

FIG. 652.

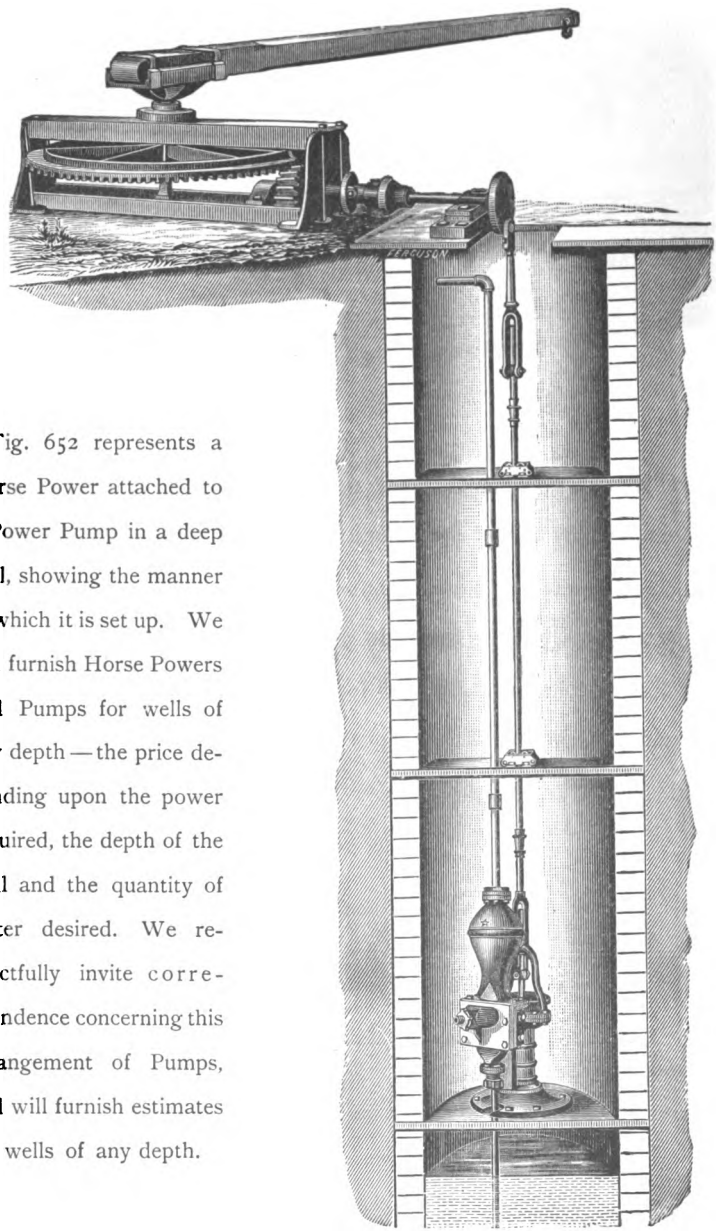
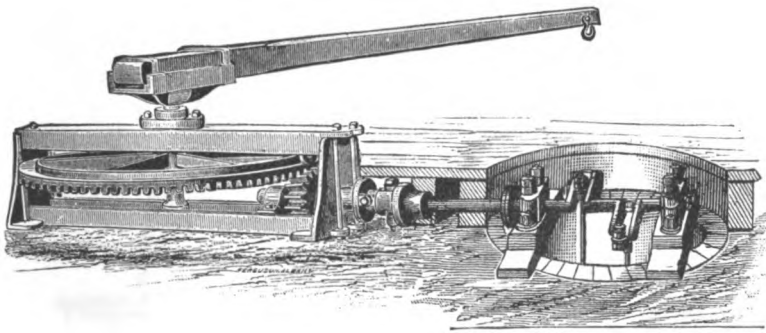


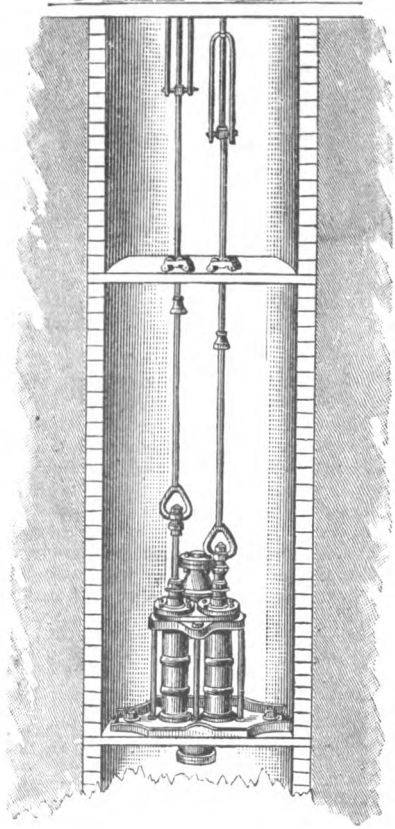
Fig. 652 represents a Horse Power attached to a Power Pump in a deep well, showing the manner in which it is set up. We can furnish Horse Powers and Pumps for wells of any depth—the price depending upon the power required, the depth of the well and the quantity of water desired. We respectfully invite correspondence concerning this arrangement of Pumps, and will furnish estimates for wells of any depth.

IRON HORSE POWER.

WITH SINGLE OR DOUBLE BARREL PUMPS — FOR DEEP WELLS.

FIG. 720.





This descriptive cut, Fig. 720, represents our Horse Power in connection with our Double Barrel Pumps with rods and guides, etc., set in a well and ready for use. We can furnish them also with our Single Barrel Pump, if desired.

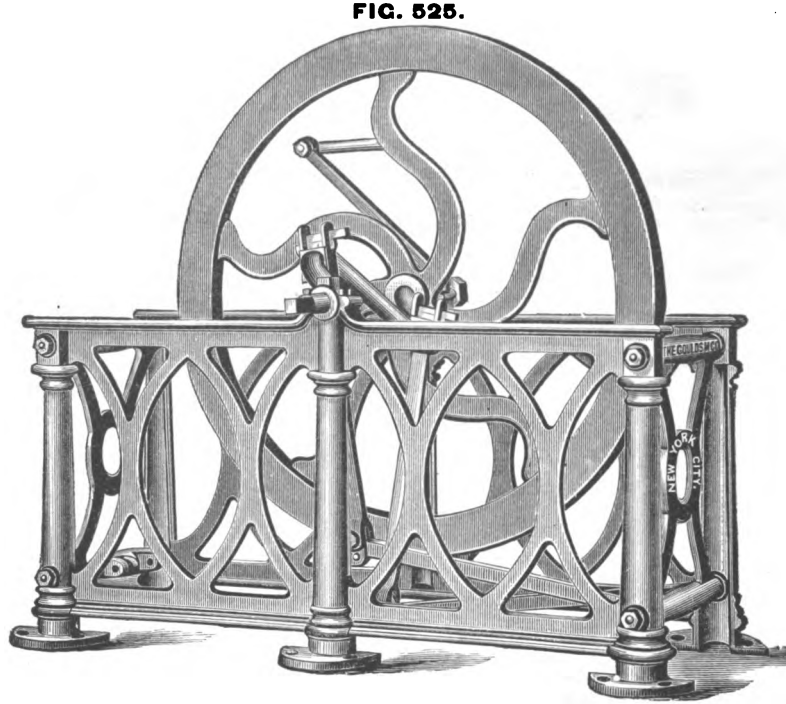
The size of Pumps and prices, as also the power required, will depend on the depth of the well and the quantity of water it is desired to elevate.

Estimates for wells of any depth furnished upon application.

HEAVY CAST IRON ENGINE FRAME.

FOR OPERATING PUMPS IN DEEP WELLS.

FIG. 525.



The cut represents our extra strong cast iron Engine Frame with *cast steel crank shaft*, fly wheel, reversible vibrating rods, and wrought iron handle, with wrought iron revolving quill. The cast steel crank turns in *gun metal* boxes, which are held by gibs and keys. We construct them with single or double crank, as ordered, made entirely of best *cast steel*, which are much superior to those of wrought, to say nothing of cast iron ones.

These Frames, used in connection either with our Pumps Figs. 514, 526 or 527 can be operated by one man in wells of great depth, and are capable of elevating considerable quantities of water, according to size of Pump used.

We also make this frame with horizontal spur gear wheel and pinion, with power of two or three to one, as ordered, with cast steel crank shaft, which we call Fig. 538. Below we give prices of each. For prices of rods, guides, etc., see page 125.

Sizes, Prices, Etc.

	Size Frame.	Height.	Diameter Fly Wheel.	SINGLE THROW STEEL CRANK SHAFT.		DOUBLE THROW STEEL CRANK SHAFT.	
				Cipher.	Price.	Cipher.	Price.
FIG. 525	23 x 62 in.	31 in.	48 in.	Jane	$82.75	Jar	$92.50
FIG. 538	23 x 62 "	31 "	48 "	Lace	92.50	Lack	102.00

Extra for two wrought iron handles, ... $5.00
" " revolving brass quills, per handle, ... 2.25

We can also put a pulley on crank shaft for running by power when ordered, in place of handle, at a suitable advance in price. See page 143 for illustration of this Frame as used over wells.

TRIANGULAR ENGINE FRAME, GEARED.

FOR OPERATING PUMPS IN DEEP WELLS.

FIG. 545.

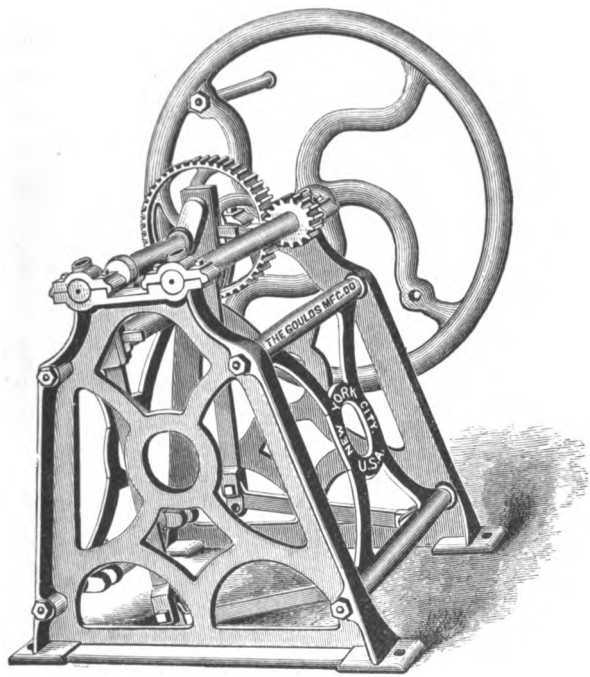


Fig. 545 represents our cast iron Engine Frame, with fly wheels, gears, winch handles and wrought-iron vibrating levers, for working two single acting or one double acting Pump in deep wells. We make them also for connecting to a single Pump, when they are known as Fig. 546. These frames can be used with either our Figs. 283, 518, 339, 514, 526 or 527.

When so stipulated we can arrange with pulleys for attaching power. We also make them without gears at correspondingly less prices. Rods and guides furnished for wells of any depth. See page 125 for prices of same.

Sizes, Prices, Etc.

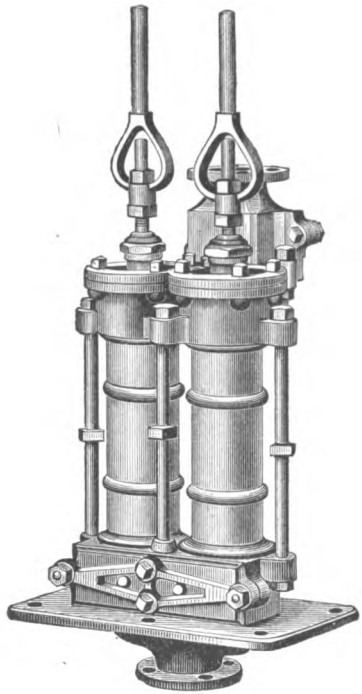
	Size Frame.	Height.	Diameter Fly Wheel.	Cipher.	Price.
FIG. 545	22 x 36 in.	34 in.	36 in.	Lamb	$81.50
FIG. 546	22 x 36 "	34 "	36 "	Lame	71.75

See page 144 for illustration of this Frame as used over wells.

SINGLE AND DOUBLE BARREL PUMPS.

WITH DOORS AND COPPER RODS.

FIG. 527.



The cut shows a Double Barrel Pump, with doors or bonnets, affording ready access to the valves. We build them with single barrel as well, which is known as Fig. 526. Either kind are furnished with iron or gun metal barrels as ordered. These Pumps are largely used in gas and chemical works, breweries, distilleries, factories, etc., and are built by the most experienced workmen and of the best material, and are provided with several improved appointments, including brass stuffing boxes and buckets, copper rods, etc. Fitted for welding connecting rods to a stub with bow as shown in cut, or pin and socket stub as preferred. Below we give prices of Figs. 526 and 527.

FIG. 527. Double Barrel. Sizes, Prices, Etc.

Diameter Barrel.	Suction and Discharge.	Stroke.	Capacity per Revolution.	IRON BARRELS.		BRASS BARRELS.	
				Cipher.	Price.	Cipher.	Price.
2½ in.	1½ in.	10 in.	2-5 gal.	Joke	$50.00	July	$63.00
3 "	2 "	10 "	3-5 "	Jolt	56.00	Jump	73.00
3½ "	2½ "	10 "	4-5 "	Jot	66.00	June	85.00
4 "	2½ "	10 "	1 "	Jove	72.00	Junk	95.00
5 "	3 "	10 "	1 3-4 "	Joy	105.00	Jury	161.00
6 "	3½ "	10 "	2 2-5 "	Jug	146.00	Just	219.00

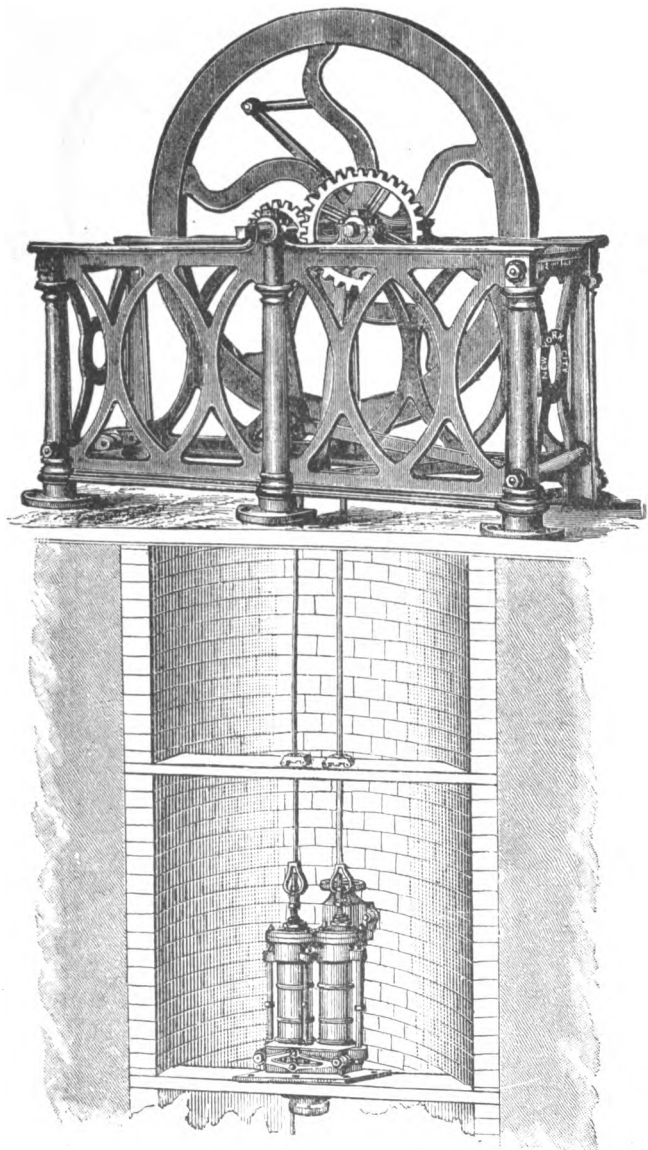
FIG. 526. Single Barrel. Sizes, Prices, Etc.

Diameter Barrel.	Suction and Discharge.	Stroke.	Capacity per Stroke.	IRON BARRELS.		BRASS BARRELS.	
				Cipher.	Price.	Cipher.	Price.
2½ in.	1½ in.	10 in.	1-5 gal.	Jaw	$34.00	Jib	$36.50
3 "	1½ "	10 "	3-10 "	Jay	36.50	Jig	41.50
3½ "	2 "	10 "	2-5 "	Jeer	41.50	Job	49.00
4 "	2 "	10 "	1-2 "	Jerk	49.00	Jog	58.00
5 "	2½ "	10 "	7-8 "	Jest	69.50	John	88.00
6 "	3 "	10 "	1 1-5 "	Jet	85.25	Join	113.00

HEAVY ENGINE FRAME, GEARED.

WITH SINGLE OR DOUBLE BARREL PUMPS. FOR DEEP WELLS.

FIG. 717.



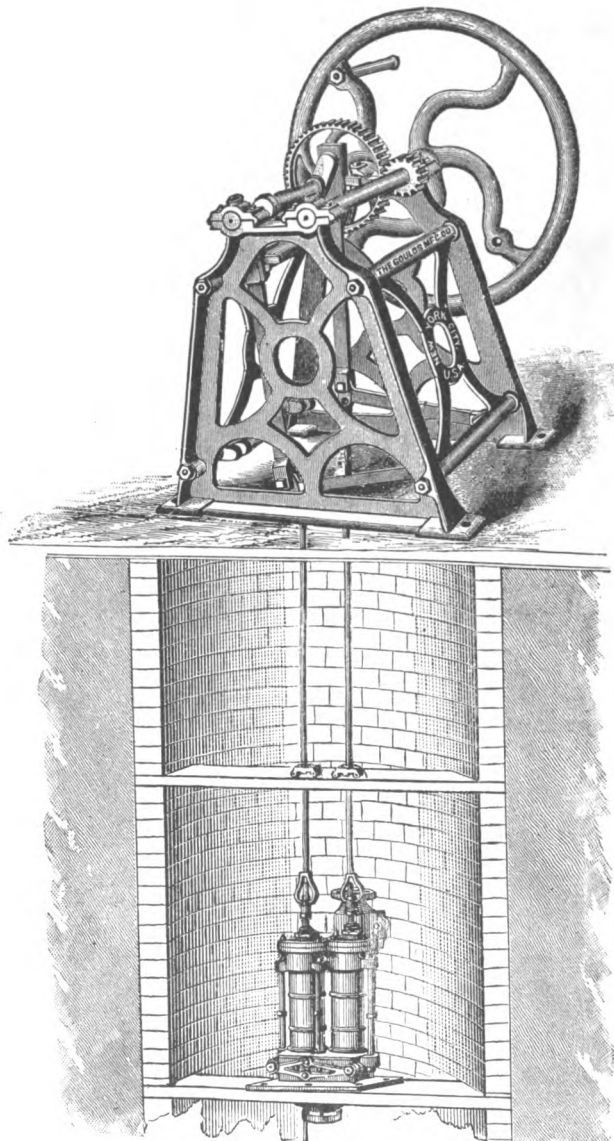
These Frames are made with horizontal spur gear wheel and pinion, with power of two or three to one, as ordered, with steel crank shaft, same as Fig. 525, page 140. For prices, capacity, etc., see page 145.

For prices of rods and guides, see page 125.

TRIANGULAR ENGINE FRAME, GEARED.

WITH SINGLE OR DOUBLE BARREL PUMPS. FOR DEEP WELLS.

FIG. 718.



This Engine Frame is made of the best material, by skilled workmen. If wanted without gears we can construct them in that way. The Cylinders are made with bonnets or doors, affording ready access to the valves. For prices and capacity see page 145. For prices of rods and guides, see page 125.

HEAVY ENGINE FRAME, GEARED.

FIG. 717. Sizes, Prices, Etc.

Diameter Barrels.	WITH SINGLE BARREL PUMPS.				WITH DOUBLE BARREL PUMPS.			
	Cipher.	Iron.	Cipher.	Brass.	Cipher.	Iron.	Cipher.	Brass.
2½ in.	Tinker	$126.60	Tiny	$129.10	Tiptoe	$152.00	Tis	$165.00
3 "	Tinkle	129.10	Tip	134.10	Tiptop	158.00	Tisic	175.00
3½ "	Tinman	134.10	Tippet	141.60	Tirade	168 00	Tisri	187.00
4 "	Tinny	141.60	Tipping	150.60	Tire	174.00	Tissue	197.00
5 "	Tinsel	162.10	Tipple	180.60	Tired	207.00	Tit	263.00
6 "	Tint	177.85	Tipsy	205.60	Tiring	248.00	Titan	321.00

TRIANGULAR ENGINE FRAME, GEARED.

FIG. 718. Sizes, Prices, Etc.

Diameter Barrels.	WITH SINGLE BARREL PUMPS.				WITH DOUBLE BARREL PUMPS.			
	Cipher.	Iron.	Cipher.	Brass.	Cipher.	Iron.	Cipher	Brass.
2½ in.	Titbit	$105.75	Tittle	$108.25	Tocka	$131.50	Tody	$144.50
3 "	Tithe	108.25	Tiver	113.25	Tocsin	137.50	Toe	154.50
3½ "	Tither	113.25	Tivy	121.25	Tod	147.50	Tofore	166.50
4 "	Title	121.25	Toad	129.75	Today	153.50	Toft	176.50
5 "	Titled	141.25	Toast	159.75	Toddle	186.50	Tofus	242.50
6 "	Titter	157.00	Tobac	184.75	Toddy	227.50	Toged	300.50

Pipe, rods and guides extra, according to the depth of well. See page 125 for prices of same. Estimates for wells of any depth furnished upon application. For illustration of these Pumps see pages 143 and 144.

At a speed of 30 revolutions per minute our Single Barrel Pumps should supply theoretically about the following quantities of water per hour, but an allowance of about 25 per centum should be made for wastage, leakage, etc.

2½	inch	will	supply	382	gallons	per hour.
3	"	"	"	550	"	"
3½	"	"	"	632	"	"
4	"	"	"	978	"	"
5	"	"	"	1529	"	"
6	"	"	"	2203	"	"

The Double Barrel Pumps will supply double the above quantities, subject, however, to the percentage of wastage, etc., referred to above.

In this connection we desire to lay down a rule for computing the capacity of any size of Pump; also the power required to operate a Pump when the capacity is ascertained, which will be found of great convenience to mechanics and others having occasion to set Pumps.

RULES.

Multiply the area of bore of Cylinder of Pump by length of stroke, and that result by the number of strokes per minute the Pump is working. This gives the quantity of water in cubic inches. Divide this by 231, number of cubic inches in a gallon, and you have total capacity of Pump per minute, in gallons and fractions of a gallon. And to ascertain the power required, multiply number of gallons per minute by 8.35, weight of one gallon, and this result by total number of feet water is raised (that is, from surface of the water to the highest point to which the water is raised), and you will have the power in foot pounds. Divide by 33,000 and you will have the horse power. One horse is equal to about five men. To the theoretical power a liberal allowance for friction, etc., always wants to be added.

CORNISH MINE PUMP HEAD.

FIG. 446.

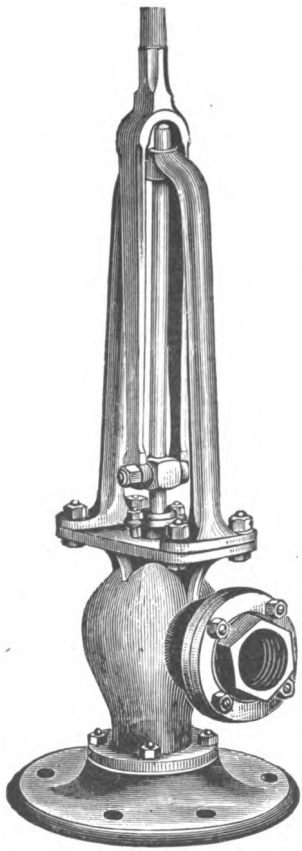


Fig. 446 shows a Working Head, provided with connecting rod, piston rod, stuffing box, guide, etc., to be used with the Cornish Cylinders on opposite page, as also the Flanged Cylinder shown below. This head is to be connected to the Cylinders by pipes and rods of sufficient length to reach to the bottom of the well or mine. We can furnish everything complete for wells of any depth.

Price.

FIG. 446, Working Head, . (Four.) . $70.00
Cut for sizes of pipe as ordered.

FLANGED DEEP WELL CYLINDER.

FIG. 618.

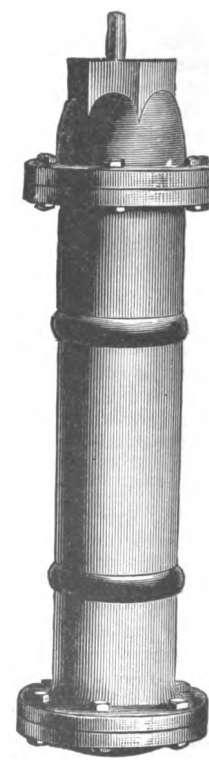


Fig. 618 represents another of our celebrated Deep Well Cylinders, constructed with flange attachments, which is considered the more desirable by many persons. They have long metal plungers and are made to do good service in very deep wells. These Cylinders can be used in connection with Fig. 446 Working Head. For use with the smaller sizes, we can construct a Working Head considerably cheaper.

We can put a strainer at the bottom, if desired.

FIG. 618. Sizes, Prices, Etc.

Dia. Cyl.	Length of Cyl.	Suction and Dis.	Stroke.	Capacity per Stroke.	Cipher.	Price.
4 in.	21 in.	2 in.	14 in.	3-4 gal	Pure	$30.00
6 "	22 "	3 "	14 "	1 2-5 "	Purl	60.00
8 "	21 "	4 "	14 "	3 "	Purr	80.00
10 "	23 "	5 "	16 "	5 2-5 "	Push	100.00

CORNISH MINE PUMP CYLINDERS.

FOR DEEP WELLS, MINES AND QUARRIES.

Fig. 445 shows the old Cornish Mine Pump Cylinder. Ours is provided at each extremity with a valve box and face plate, as shown in the cut, which has only to be removed to afford quick access to either the upper or lower valves for repairs. With only one valve box at the bottom of Cylinder, as is the case with most of them, the piston cannot be taken out and replaced where it is leather or rubber packed. We make these Cylinders with either metallic pistons or packed with leather or rubber, as the case requires. In deep wells they are often used for raising large quantities of water. Being placed at the very bottom of the mine shaft or well, the valves are always under the water and cannot fail to operate. The absence of suction pipe is a notable feature of this Pump. Perfect satisfaction will surely follow the employment of this Pump, as we guarantee it to be unexcelled in every respect.

The cuts shown below are identical in internal construction. The one at the right showing the method of making the 5 in. and 6 in. Cylinders, and the one at the left the 8 in. and 10 in. Cylinders. The working head that goes with these Cylinders is shown by Fig. 446 on the opposite page.

FIG. 445.

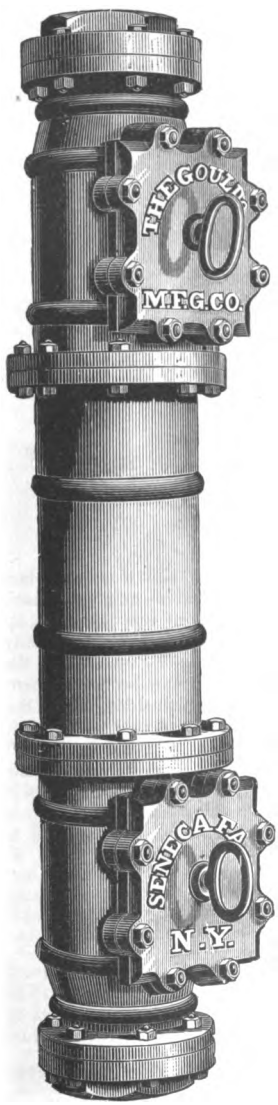


FIG. 445.

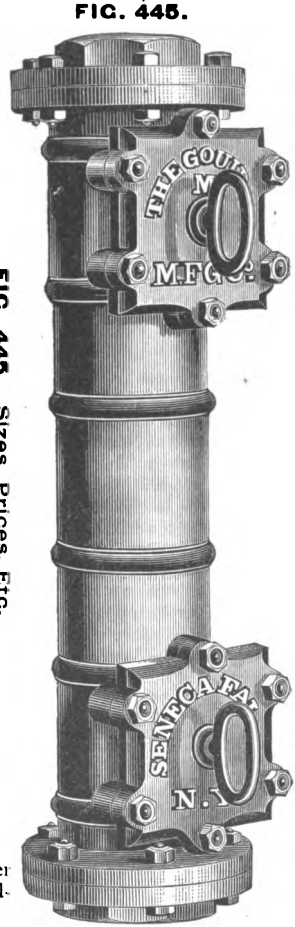


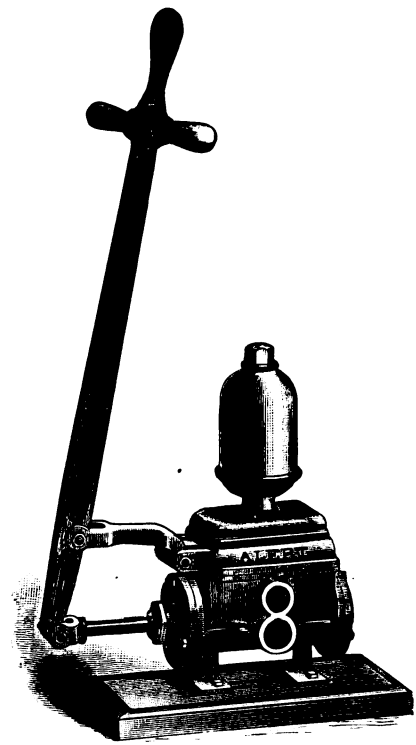
FIG. 445. Sizes, Prices, Etc.

Diameter Cylinder.	Suction and Discharge.	Stroke.	Capacity per Stroke.	Cipher.	Price.
5 in.	3 in.	14 in.	1 1-5 gal.	Form	$ 60.00
6 "	3 or 4 "	14 "	1 7-10 "	Fort	75.00
8 "	4 or 5 "	16 "	3 1-2 "	Forth	100.00
8 "	4 or 5 "	18 "	4 "	Forty	110.00
10 "	5 or 6 "	15 "	5 1-10 "	Forum	125.00
10 "	5 or 6 "	18 "	6 1-8 "	Found	135.00
10 "	5 or 6 "	20 "	6 4-5 "	Fount	150.00

We prefer the larger sizes of pipe to the smaller ones.

"ALERT"
DOUBLE ACTING HORIZONTAL FORCE PUMP.

FIG. 747.



As the cut implies, this new Pump is similar to the "Challenge," which we were first to build and popularize, but instead of the expensive composition valves and valve seats, this Pump has leather valves. In general character it partakes of the Steam Pump style, the valves all being grouped together under the air chamber, and can be readily exposed to view without disturbing either the inlet or outlet pipes, by unscrewing the heavy brass nut on top of the air chamber, when the whole Pump can be taken apart.

The suction and discharge openings screwed for iron pipe, are on both sides of Cylinder (we plug one set) so that suction or discharge can be used on either or both sides, if necessary, or two pipes can be run from Pump, one to supply water at the Pump, and the other to run to a tank in another part of the house or building, thus being the same as any other Pump with two discharges. This little bundle of compactness and power occupies floor space of eight by twenty inches, and will work against any pressure up to 100 pounds. We always screw them for sizes of iron pipe named below, but can fit them for lead pipe or hose, if ordered.

FIG. 747. Sizes, Prices, Etc.

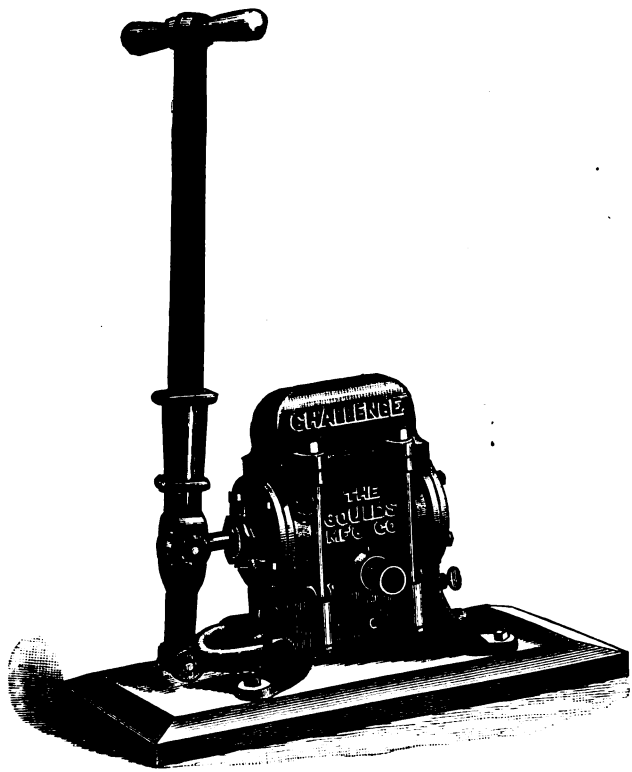
No.	Diameter Cylinder.	Double Suction.	Double Discharge.	Stroke.	Capacity per Rev.	Floor Space.	Cipher.	Price.
2	2½ in.	1¼ in.	1 in.	5 in.	1-5 gal.	8 x 20 in.	Vare	$16.00
4	3 "	1¼ "	1 "	5 "	3-10 "	8 x 20 "	Varech	18.00
6	3½ "	1½ "	1¼ "	5 "	2-5 "	8 x 20 "	Vives	24.00
8	4 "	1½ "	1¼ "	5 "	1-2 "	8 x 20 "	Vivid	31.00

We charge extra for brass nipples for lead pipe connections, also for half hose couplings, when ordered fitted for hose.

"CHALLENGE"
DOUBLE ACTING HORIZONTAL FORCE PUMP.

ON PLANK, WITH BRASS LINED CYLINDER. ADJUSTABLE LEVER.

FIG. 470.



The cut represents a Double Acting Force Pump on plank, of great compactness and power, especially adapted for use on shipboard, wharves, etc., as it can be moved from place to place. The Cylinder is lined with brass; the piston rod, valves and valve seats are bronze; the nuts on the rods on either side of Pump are brass also, so that it will be seen all parts of the Pump exposed to the action of water are non-corrosive.

At each end of bed plate are brass plugs for letting off the water to prevent freezing, while there is another and larger brass plug for priming the Pump when necessary.

The valves are readily laid bare by unscrewing the brass nuts on sides of air chamber.

Remove the air chamber and the upper ones are exposed to view; or, remove the body of Pump and the lower ones are accessible. We fit them for hose connections, though we furnish connections for either lead or iron pipe, if ordered. Only one set of connections goes with a Pump at list price.

A malleable wrench, fitting all the nuts and hose couplings, goes with each Pump.

FIG. 470. Sizes, Prices, Etc.

No.	Diameter Cylinder.	Suction.	Discharge.	Stroke.	Capacity per Rev.	IRON.		BRASS.	
						Cipher.	Price.	Cipher.	Price.
8	4 in.	1½ in.	1¼ in.	4½ in.	1-2 gal.	Grab	$28.00	Lone	$90.00
12	5 "	2 "	1½ "	5 "	7-8 "	Grace	42.00	Long	110.00

"CHALLENGE"
DOUBLE ACTING HORIZONTAL FORCE PUMP.

ON BASE, WITH BRASS LINED CYLINDER. ADJUSTABLE LEVER.

FIG. 494.

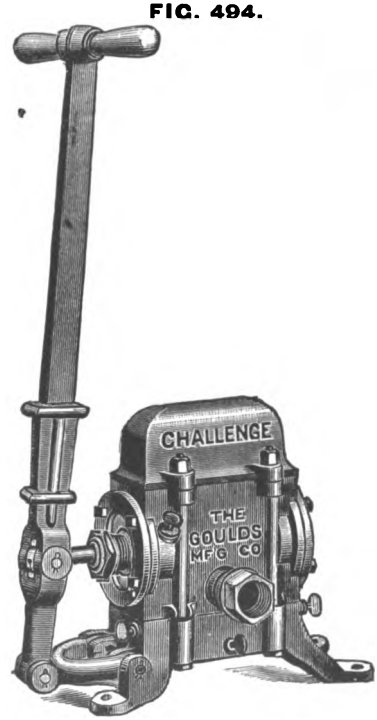


Fig. 494 represents our Double Acting "Challenge" Force Pump, with heavy cast-iron base, and adapted for every purpose where a stationary Pump of this kind can be used about the house, factory, store, etc., etc. The Pump itself is eight inches one way, and about fourteen the other, and takes up very little room. For forcing water into a tank or reservoir into an upper story, or into a bath room, by reason of the small amount of room it requires, it will be much sought after.

It will be observed in this Pump, as well as in Fig. 470, the induction opening is above the lower valves, so they are submerged.

A malleable wrench, fitting all the nuts and couplings, goes with each Pump.

Always fitted suction and discharge for iron pipe, unless otherwise ordered.

FIG. 494. Sizes, Prices, Etc.

No.	Diameter Cylinder.	Suction.	Dis.	Stroke.	Capacity per Rev.	IRON.		BRASS.	
						Cipher.	Price.	Cipher.	Price.
2	2½ in.	1¼ in.	1 in.	4½ in.	1-5 gal.	Hawk	$27.00	Loon	$75.00
4	3 "	1¼ "	1 "	4½ "	3-10 "	Hay	27.00	Lope	75.00
8	4 "	1½ "	1¼ "	4½ "	1-2 "	Haze	28.00	Loss	90.00
12	5 "	2 "	1½ "	5 "	7-8 "	Hazy	42.00	Lost	110.00

"CHALLENGE"
DOUBLE ACTING HORIZONTAL FORCE PUMP.

WITH BRASS LINED CYLINDER AND ADJUSTABLE LEVER, MOUNTED ON PLATFORM WITH WHEELS.

FIG. 774.

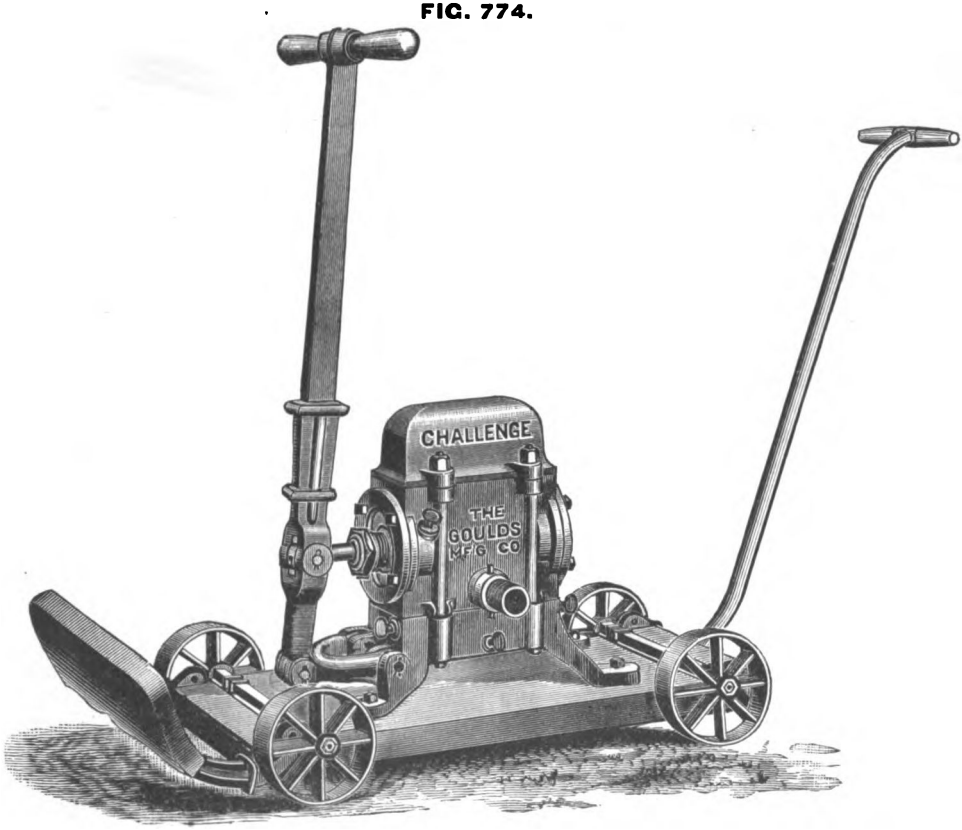


Fig. 774 represents our well-known "Challenge" Double Acting Force Pump mounted on platform with wheels for ready use at any place about factories, warehouses, wharves, etc. The Cylinder is lined with brass, the piston rod, valves and valve seats are bronze, so that all parts exposed to wear and the action of the water are non-corrosive and not liable to get out of repair.

The platform brake answers a two-fold purpose, being large enough to admit of the operator standing upon it while working the Pump, and at the same time holding it firm and steady.

Where effective service is required about property, this is one of the most powerful Hand Engines we have ever made, beside it can be adapted to almost any need or purpose.

Suction and discharge always fitted for hose unless otherwise ordered.

FIG. 774. Sizes, Prices, Etc.

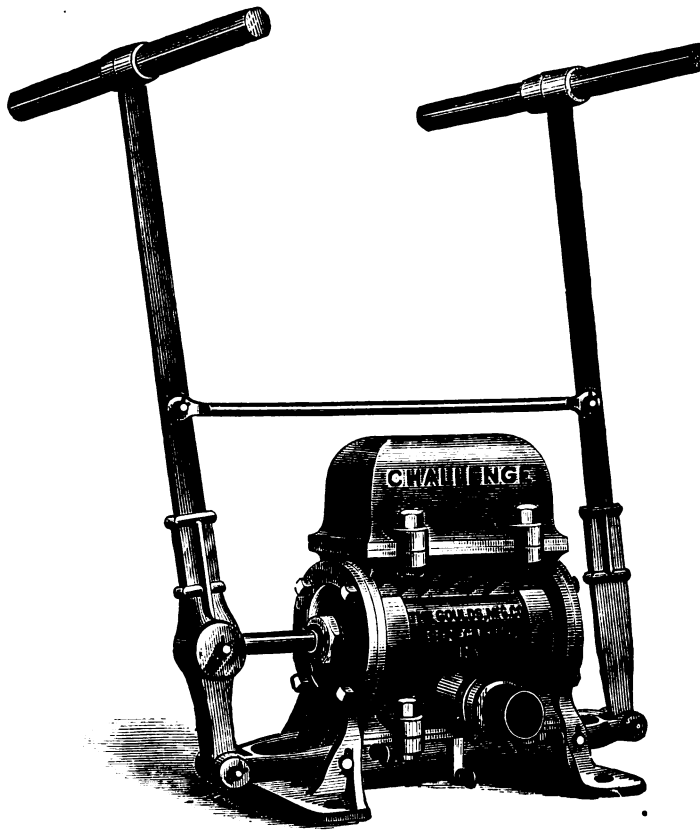
No.	Diameter Cylinder.	Suction.	Dis.	Stroke.	Capacity per Revolution.	IRON.		BRASS.	
						Cipher.	Price.	Cipher.	Price.
2	2½ in.	1¼ in.	1 in.	4½ in.	1·5 gal.	Vitrify	$40.00	Vocalize	$90.00
4	3 "	1¼ "	1 "	4½ "	3-10 "	Vitriol	45.00	Vocally	95.00
8	4 "	1½ "	1¼ "	4½ "	1-2 "	Vituline	53.00	Vocation	115.00

"CHALLENGE"
DOUBLE ACTING HORIZONTAL FORCE PUMP.

WITH BRASS-LINED CYLINDER AND DOUBLE LEVERS.

FIG. 562.

PATENTED SEPTEMBER 5TH, 1876.



The above cut represents another design of our celebrated "CHALLENGE" DOUBLE ACTING FORCE PUMPS, the very name of which implies something strong, durable and effective, and which must engage the attention of our many patrons and friends.

The Cylinder is lined with brass; the piston rod, valves and valve seats are of bronze; the nuts on the bolts at the side are of brass, so that it will be seen all parts of the Pump exposed to water are non-corrosive.

This Pump has only one stuffing box, so that it is less liable to leak than with two, and in case of such an accident, one set of valves would be in readiness at all events.

For use on ship wharves, about factories, mills, warehouses, etc., it is capable of inestimable service.

Both suction and discharge fitted for hose unless otherwise ordered.

Can be fitted for wrought-iron pipe if desired.

FIG. 562. Sizes, Prices, Etc.

No.	Diameter Cylinder.	Suction.	Dis.	Stroke.	Capacity per Rev.	IRON.		BRASS.	
						Cipher.	Price.	Cipher.	Price.
12	5 in.	2 in.	1½ in.	5 in.	7-8 gal.	Lead	$45.00	Look	$125.00
16	6 "	2½ "	2 "	5 "	1 1-4 "	Leaf	50.00	Loom	175.00

"CHALLENGE"
DOUBLE ACTING HORIZONTAL FORCE PUMP.

WITH BRASS-LINED CYLINDER, FOR HAND OR POWER.

FIG. 708.

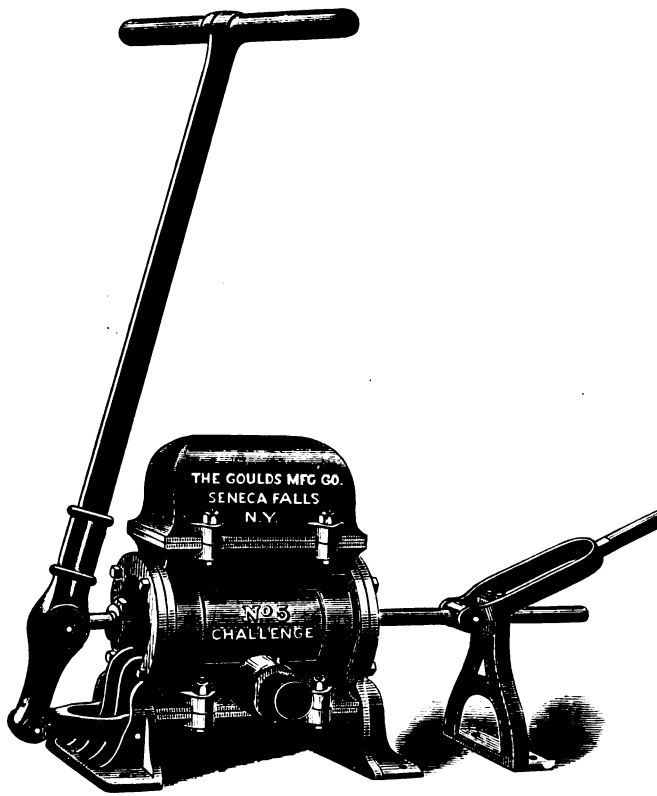


Fig. 708 represents one of our "Challenge" Double Acting Force Pumps, arranged with pitman and guide to connect to either steam or water power, and with a removable hand lever. These Pumps are constructed in the same thorough manner as our Figs. 470, 562, etc., more fully described on the previous pages.

Always fitted for gas pipe unless otherwise ordered.

FIG. 708. Sizes, Prices, Etc.

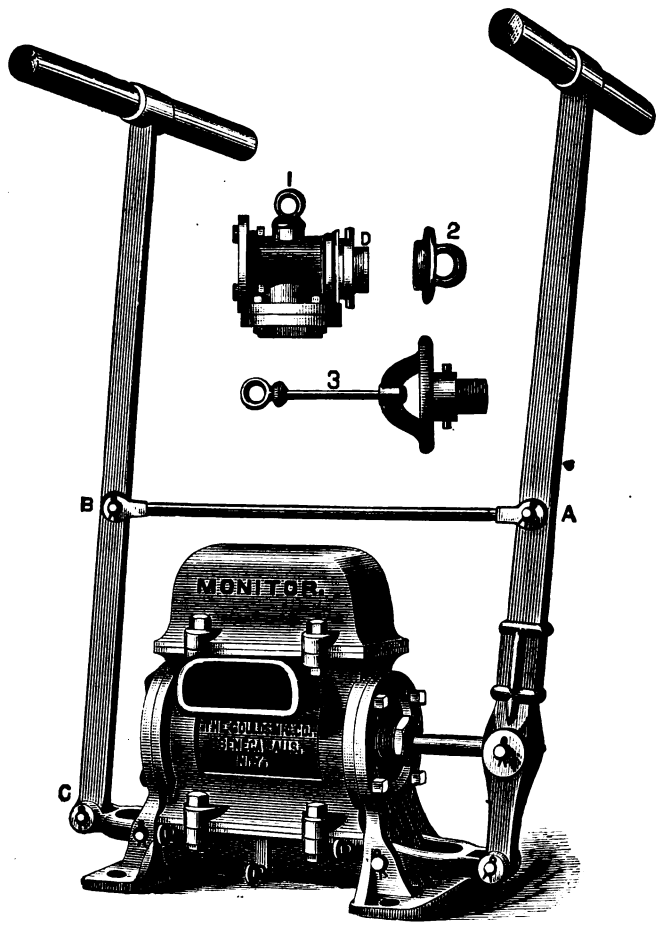
No.	Diameter Cylinder.	Suction.	Dis.	Stroke.	Capacity per Rev.	IRON.		BRASS.	
						Cipher.	Price.	Cipher.	Price.
2	2½ in.	1¼ in.	1 in.	4½ in.	1-5 gal.	River	$35.00	Venal	$85.00
4	3 "	1¼ "	1 "	4½ "	3-10 "	Rivet	40.00	Venary	90.00
8	4 "	1½ "	1¼ "	4½ "	1-2 "	Roach	45.00	Venatic	105.00
12	5 "	2 "	1½ "	5 "	7-8 "	Scow	55.00	Venation	125.00
16	6 "	2½ "	2 "	5 "	1 1-4 "	Scowl	60.00	Vend	175.00

"MONITOR"
DOUBLE ACTING SUCTION AND FORCE PUMP COMBINED.

BRASS-LINED CYLINDER AND DOUBLE LEVERS.

FIG. 581.

PATENTED SEPTEMBER 5TH, 1876.



The cut exhibits our Double Acting Monitor Suction Pump, for elevating large quantities of water from the holds of vessels, or from wells, cisterns, reservoirs, etc., etc. It is essentially a Brass Pump, as the Cylinder is lined with that metal, and most of the nuts and all the thumb screws are made of it, while the piston rod, valves and their seats are made of the best composition metal. By the addition of a very few and inexpensive appliances this Pump can be converted into a very powerful engine, with a capacity of forcing a good-sized stream of water a long

distance, thus combining in one machine, and at a little more cost, a Lifting and Force Pump when required. On shipboard this Pump can be set as Bilge Pumps usually are, with the iron suction pipe extending into the hold, and by very simple changes a Force Pump can be had for extinguishing fires, washing decks, etc., etc. One Pump, therefore, performs the functions of two, and we guarantee that in either capacity it will give all the satisfaction that either of two Pumps would, designed especially for only one purpose.

A little explanation will suffice to demonstrate the superiority and practicability of our device. The elbow 1, with cap 2 (which screws into the elbow as well as piece D, as shown), go with the Pump as a Suction or Bilge Pump. When the Combined Pump is wanted the pieces 3 and D are supplied. Piece D, when screwed into its place, extends the whole length of the elbow over against the body of the Pump, making an air-tight joint, and cuts off all connection with the water except through the hose. To convert into a Force Pump it is only necessary to unscrew the cap 2, insert the brass hose coupling D, with hose attached, into 1, and fasten on piece 3 to the mouth of the Pump, which is done by a nut on the opposite side. Rubber packings go with each piece, so that water or air-tight joints are made. One or both levers can be disconnected by removing the split keys at A B C, and the water drawn out of Pump through openings for this purpose.

Under the air chamber, which is easily detached, lie the upper valves, while by unscrewing the four nuts that secure the bed-plate to the cylinder, the cylinder can be raised and the lower valves are exposed. The position of the Pump or the pipes have, therefore, in no way to be disturbed should the valves get clogged and must be got at. We can most heartily commend this Pump to our friends. Both suction and discharge fitted for hose unless otherwise ordered, but we can fit for iron pipe if so desired.

SUCTION AND BILGE PUMP.

FIG. 581. Sizes, Prices, Etc.

No.	Diameter Cylinder.	Suction.	Discharge.	Stroke.	Capacity per Revolution.	Cipher.	Price.
16	6 in.	2½ in.	2 in.	5 in.	1 1-4 gal.	Melt	$50.00

COMBINED PUMP.

FIG. 582. Sizes, Prices, Etc.

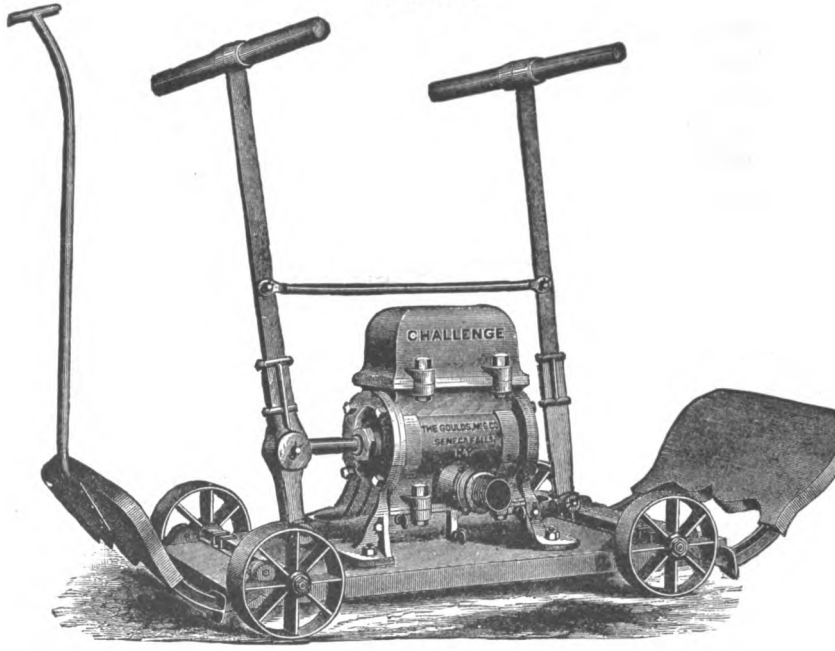
No.	Diameter Cylinder.	Suction.	Discharge.	Stroke.	Capacity per Revolution.	Cipher.	Price.
16	6 in.	2½ in.	2 in.	5 in.	1 1-4 gal.	Mend	$56.00

"CHALLENGE"

DOUBLE ACTING HORIZONTAL FORCE PUMP.

WITH BRASS-LINED CYLINDER AND DOUBLE LEVERS, MOUNTED ON PLATFORM WITH WHEELS.

FIG. 770.



The above cut represents our larger size Double Acting "Challenge" Pumps, mounted on platform with wheels, so they can readily be moved from place to place. Want of space prevents our showing this admirable Pump full size with those previously illustrated, but it is exactly the same as Fig. 562, shown on page 152.

It will also be remembered that this Pump is brass lined and provided with brass piston rod and composition bronze valves and valve seats, making it capable of resisting the effects of salt water or acids, besides being almost indestructible. The double platform brakes answer a twofold purpose, being large enough to admit of the operators standing upon them while working the Pump, and holding it firm and steady.

Suction and discharge always fitted for hose, unless otherwise ordered.

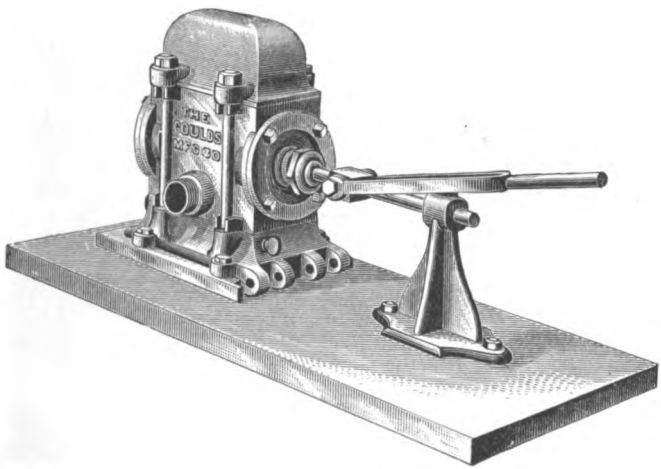
FIG. 770. Sizes, Prices, Etc.

No.	Diameter Cylinder.	Suction.	Dis.	Stroke.	Capacity per Rev.	IRON.		BRASS.	
						Cipher.	Price.	Cipher.	Price.
12	5 in.	2 in.	1½ in.	5 in.	7-8 gal.	Vial	$70.00	Vocative	$150.00
16	6 "	2½ "	2 "	5 "	1 1-4 "	Viand	75.00	Vocule	200.00

"CHALLENGE"
DOUBLE ACTING HORIZONTAL FORCE PUMP.

WITH WROUGHT-IRON PITMAN, GUIDE AND GUIDE ROD.

FIG. 604.



The cut shows our Fig. 470, mounted on plank, with pitman, guide and guide rod for attaching to face plate and crank pin, by means of connecting rod.

For a detailed description of the construction of this Pump we would refer to our Fig. 470, page 149. We have sold quite a number of our Challenge Pumps arranged in this way, and they have given good satisfaction. Railroad companies use this Pump extensively at their watering stations, operating it by Horse Power. They can be run up to a maximum of 75 to 80 revolutions per minute, though 40 or 50 would be better. This Pump would be very good for fire purposes.

Both suction and discharge fitted for gas pipe, unless otherwise ordered.

FIG. 604. Sizes, Prices, Etc.

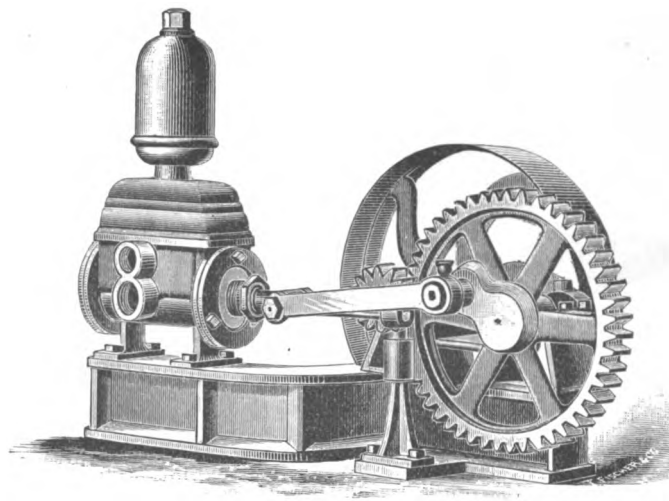
No.	Diameter Cylinder.	Suction.	Dis.	Stroke.	Capacity per Rev.	IRON.		BRASS.	
						Cipher.	Price.	Cipher.	Price.
2	2½ in.	1¼ in.	1 in.	4½ in.	1-5 gal.	Mole	$30.00	Vended	$80.00
4	3 "	1¼ "	1 "	4½ "	3-10 "	Molt	30.00	Vendee	80.00
8	4 "	1½ "	1¼ "	4½ "	1-2 "	Monk	32.00	Vender	95.00
12	5 "	2 "	1½ "	5 "	7-8 "	Mood	50.00	Vendible	120.00
16	6 "	2½ "	2 "	5 "	1 1-4 "	Moon	55.00	Vendibly	170.00

"ALERT"

DOUBLE ACTING HORIZONTAL FORCE PUMP.

ON FRAME. FOR POWER USE.

FIG. 769.



We illustrate above our Double Acting "Alert" Force Pump mounted on iron frame, with gearing, pulley, etc., for power use.

A description of the construction of this Pump will be found under Fig. 747. The gear is in proportion of 4 to 1 of the pinion, so that if the pulley on pinion shaft has a speed of from 180 to 200 revolutions, the Pump will run 45 to 50 revolutions per minute, which, for continual service, is rapid enough.

This is a thoroughly good power Pump, as we have ascertained from actual practice, and can be safely used against a pressure of 100 to 125 pounds per square inch, or, say, for pumping water 50 to 60 feet, including distance both below and above Pump.

This style of Pump can be used with high speeded engines of one or two horse power for raising water to the upper stories of buildings or tanks at railroad stations, etc., or for irrigation, and will be found most reliable and satisfactory.

We would not advise using less than a 12 x 3 inch pulley on pinion shaft.

A glance at table below, showing floor space required, will demonstrate the wonderful compactness of this Pump, which is one of our latest and most excellent productions.

As shown, it can be used where water surface is 20 to 25 feet below; but we contemplate building one for mine shafts, wells, etc., of almost any depth.

Always fitted for wrought-iron pipe, unless otherwise ordered.

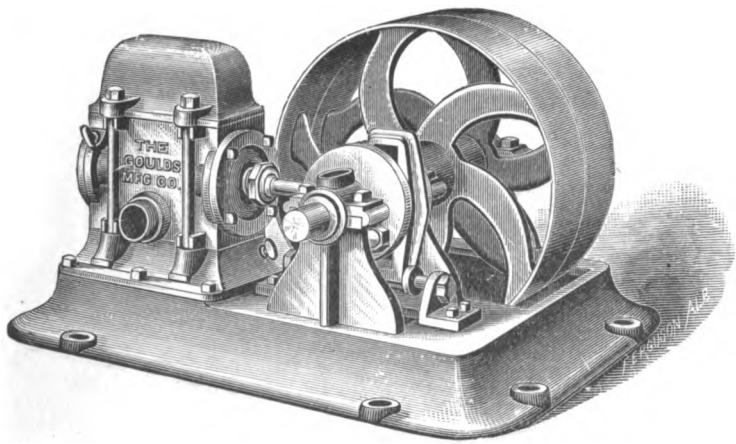
FIG. 769. Sizes, Prices, Etc.

No.	Diam. Cyl.	Double Suction.	Double Dis.	Stroke.	Capacity per Stroke.	Floor Space.	Size Pulley.	Cipher.	Price.
4	3 in.	1¼ in.	1 in.	5 in.	3-10 gal.	14 x 26 in.	15 x 3 in.	Viatic	$45.00
6	3½ "	1½ "	1¼ "	5 "	2-5 "	14 x 26 "	15 x 4 "	Vibrant	65.00
8	4 "	1½ "	1¼ "	5 "	1-2 "	14 x 26 "	15 x 4 "	Vibrate	75.00

"CHALLENGE"
DOUBLE ACTING HORIZONTAL FORCE PUMP.

ON FRAME, WITH PULLEYS FOR POWER.

FIG. 603.



The cut shows our Double Acting *brass-lined* Challenge Suction and Force Pump, mounted on cast-iron bed plate, with turned tight and loose pulleys, 4 inches face and 18 inches diameter. This is the most complete as well as compact Pump of the kind ever built, the whole thing measuring on the floor 25 by 32 inches, and 19 inches high at extreme point. The piston is worked from a crank with a link motion, the crank pin working in a solid gun-metal box, while a guide on under side of the link prevents all undue wear of the piston rod and stuffing box. The crank shaft is made long enough to take a hand crank at either extremity (which we can furnish when ordered), and is supported, it will be observed, by a strong bearing on each side of crank, and these bearings are lined with the best anti-friction metal. The valves, seats, piston-rod, stuffing-box and follower, and some other parts, are made of brass and gun metal, and the whole machine is constructed with a view to its performing severe and continued labor without premature wearing out. They can be run up to a maximum speed of 75 to 80 revolutions per minute, though 40 or 50 would be better. We guarantee this Pump to work against a pressure of 100 pounds to the square inch. The Pump is amply provided with brass plugs for emptying it in cold weather. This Pump will be very good to force water through hose for extinguishing fires, etc. We usually fit them for wrought-iron pipe connections, but will arrange them for either hose or lead pipe if desired, at no extra charge.

FIG. 603. Sizes, Prices, Etc.

No.	Diameter Cylinder.	Suction.	Dis.	Stroke.	Capacity per Revolution.	IRON.		BRASS.	
						Cipher.	Price.	Cipher.	Price.
4	3 in.	1¼ in.	1 in.	4½ in.	3-10 gal.	Mode	$70.00	Voider	$120.00
8	4 "	1½ "	1¼ "	4½ "	1-2 "	Mold	75.00	Voiding	135.00

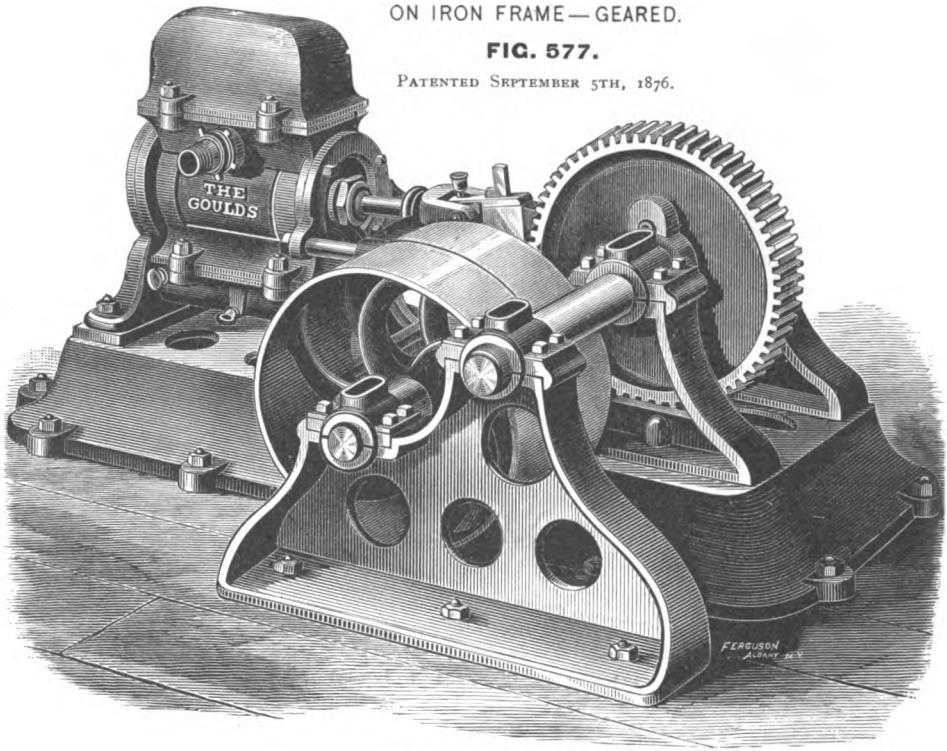
Hand Cranks, ... $2.00 extra.

"CHALLENGE"
DOUBLE ACTING HORIZONTAL FORCE PUMP.

ON IRON FRAME—GEARED.

FIG. 577.

PATENTED SEPTEMBER 5TH, 1876.



The above cut shows one of the most perfect and substantial Pumps we have ever made. It has every possible qualification essential to commend it. We name some of the features connected with it: The working parts of the Pump are all brass. The Cylinder is brass lined, and, by unscrewing the brass nuts at the side, both the upper and lower valves are accessible, without disconnecting either the suction or discharge pipes. The gears are cut and are 6 inches and 16 inches diameter respectively. The relative sizes of these gears could be changed if desired, arranging them so as to work against a very heavy pressure, or to run faster, against lighter pressure. The connecting rod has strap joints with gib and key, and with brass boxes. The cross head runs on two substantial guides, thereby taking all the lateral pressure off the stuffing box and piston, and at the same time forms a brace from the Pump cylinder to the pillow blocks.

The frame is all cast iron (weighing over 700 lbs.), very heavy and strong, occupying a space 5 feet long by 2 feet 3 inches wide — at the pulleys 3 feet 3 inches wide. The whole Pump weighs about 1,000 lbs., so that it will be seen that it is capable of doing good and continuous service. The pulleys could be run at from 120 to 160 revolutions, which would give 90 to 120 strokes of Pump respectively. For continued work the less speed is the best for the economical working of the Pump. When used for fire protection it could be run at a higher rate of speed. We fit them for either hose or wrought-iron pipe connections, as ordered.

FIG. 577. Sizes, Prices, Etc.

No.	Diameter Cylinder.	Suction.	Dis.	Stroke.	Capacity per Rev.	Diameter Pulleys.	Face Pulleys.	Cipher.	Price.
16	6 in.	2½ in.	2 in.	5 in.	1 1-4 gal.	18 in.	5 in.	Less	$225.00

BRASS TWO-CYLINDER FORCE PUMP.

FOR SHIPS, WHARVES AND FACTORIES.

FIG. 773.

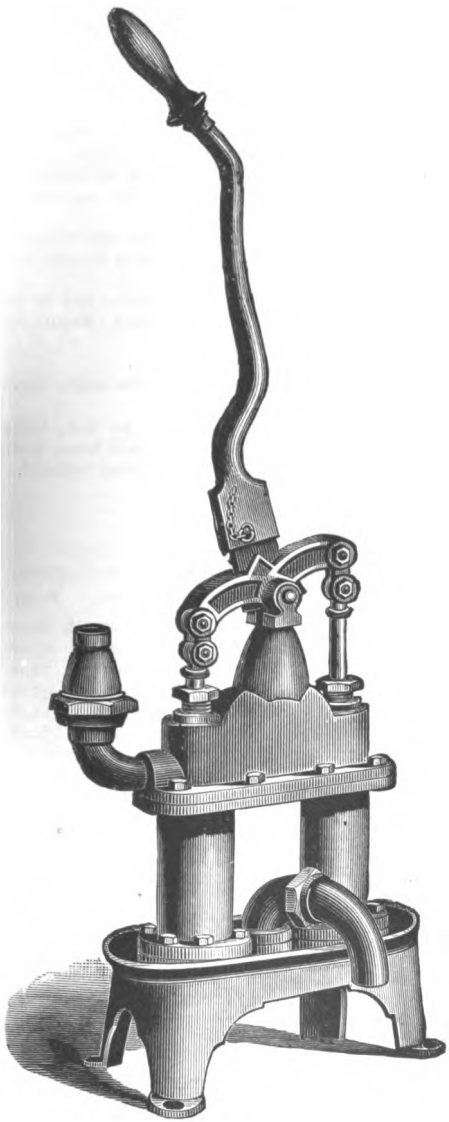


Fig. 773 represents our Two-Cylinder Ship Force Pump with Brass Cylinders, air chamber, rods and stuffing boxes, making it to all purposes a Brass Pump. This Pump combines some new features over other Pumps of its class, which might be enumerated briefly as the two vertical working pistons, actuated by one horizontal lever, and having the full effect of a double acting Pump.

It will be noticed the suction is in the form of a syphon, which has the effect of keeping the lower valves at all times, when in use, under water and thus insuring the best safeguard for a ready and perfect working Pump.

Brass plugs are provided for emptying the Pump of water in cold weather.

The suction and discharge are fitted for lead or iron pipe, as ordered.

We build three sizes of this Pump, as per description given below.

FIG. 773. Sizes, Prices, Etc.

No.	Diameter Cylinders.	Suction.	Discharge.	Capacity per Revolution.	Cipher.	Price.
0	2 in.	1¼ in.	1 in.	1-5 gal.	Vendor	$25.00
2	2½ "	1¼ "	1¼ "	1-4 "	Vendue	35.00
4	3 "	1½ "	1¼ "	1-3 "	Veneer	60.00

CLOSE TOP TWO-CYLINDER FORCE PUMPS.

The cut, Fig. 283, exhibits a new and very superior Force Pump, with double cylinders, levers, etc., and may be worked by hand or machinery, while Fig. 284 is the same Pump with folding brakes, and Fig. 285 the same as the latter mounted on platform with wheels. They are made with brass-cased piston rods, brass plunger, valves and stuffing boxes.

The valve at the bottom of the Cylinder is double and *entirely new* in its construction, and can be readily tripped or opened by pressing down the lever until it strikes the top of the air chamber.

The *peculiar advantage* of this DOUBLE VALVE over the ordinary one is, that while with the *single valve* the pressure of the column of water is so great as to make it difficult (and in Pumps of large size nearly impossible) to trip it, yet by this arrangement the additional leverage obtained by placing a *small valve* in the top of the *main valve* renders the process perfectly easy, and always certain.

By simply turning the thumb-screw at the bottom of the air chamber, and tripping the small valve at the bottom of the Cylinder, the water in the Pump is at once discharged, thus entirely preventing the Pump from freezing.

The Pump is simple in its construction — not liable to get out of order — and by the *directness of its action* and consequent *freedom from friction* is a most *efficient and powerful Pump.*

As an *anti-freezing Suction and Force Pump* it has no equal.

We make them with Iron Cylinders or with Brass Cylinders, and all the entire *working portions* of the Pump of the same material.

The sizes of openings given below could be varied some, as well as not, using smaller pipe and hose. We can also adapt Figs. 283 and 284 for suction hose, when ordered, at no extra charge, but all Pumps fitted as below, unless otherwise ordered.

FIG. 283. Sizes, Prices, Etc.

No.	Diameter Cylinders.	Suction for Pipe.	Discharge for Hose.	Stroke.	Capacity per Rev.	IRON CYLINDERS.		BRASS CYLINDERS.	
						Cipher.	Price.	Cipher.	Price.
2	2½ in.	2 in.	1¼ in.	6 in.	1-4 gal.	Daze	$ 38.00	Debar	$ 60.00
4	3 "	2 "	1¼ "	6 "	3-8 "	Dazzle	40.00	Debase	65.00
6	3½ "	2½ "	1¼ "	6 "	1-2 "	Deaf	47.00	Debit	78.00
8	4 "	2½ "	1½ "	6 "	2-3 "	Deal	55.00	Debt	95.00
10	4½ "	3 "	2 "	6 "	7-8 "	Dean	70.00	Debut	115.00
16	6 "	4 "	3 "	8 "	2 "	Dear	110.00	Decay	170.00

FIG. 284. Sizes, Prices, Etc.

No.	Diameter Cylinders.	Suction for Pipe.	Discharge for Hose.	Stroke.	Capacity per Rev.	IRON CYLINDERS.		BRASS CYLINDERS.	
						Cipher.	Price.	Cipher.	Price.
2	2½ in.	2 in.	1¼ in.	6 in.	1-4 gal.	Deck	$ 58.00	Deep	$ 80.00
4	3 "	2 "	1¼ "	6 "	3-8 "	Decker	60.00	Deeply	85.00
6	3½ "	2½ "	1¼ "	6 "	1-2 "	Decoy	67.00	Deer	98.00
8	4 "	2½ "	1½ "	6 "	2-3 "	Decry	75.00	Defer	115.00
10	4½ "	3 "	2 "	6 "	7-8 "	Deed	90.00	Defix	135.00
16	6 "	4 "	3 "	8 "	2 "	Deem	130.00	Deft	190.00

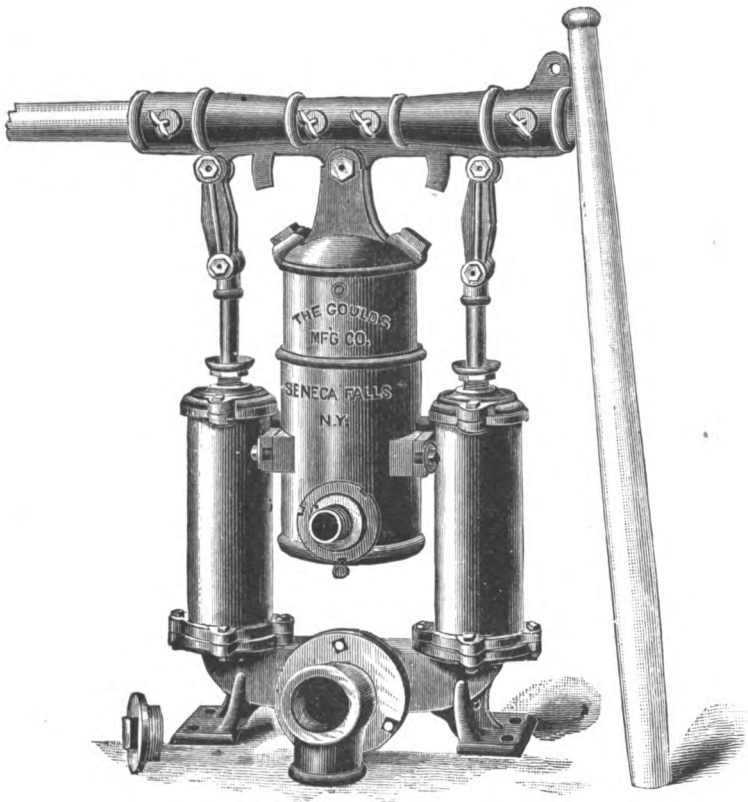
FIG. 285. Sizes, Prices, Etc.

No.	Diameter Cylinders.	Suction for Hose.	Discharge for Hose.	Stroke.	Capacity per Rev.	IRON CYLINDERS.		BRASS CYLINDERS.	
						Cipher.	Price.	Cipher.	Price.
2	2½ in.	2 in.	1¼ in.	6 in.	1-4 gal.	Defy	$ 68.00	Delay	$ 90.00
4	3 "	2 "	1¼ "	6 "	3-8 "	Visional	70.00	Visit	95.00
6	3½ "	2½ "	1¼ "	6 "	1-2 "	Deify	77.00	Delf	108.00
8	4 "	2½ "	1½ "	6 "	2-3 "	Deign	85.00	Dell	125.00
10	4½ "	3 "	2 "	6 "	7-8 "	Deist	100.00	Delve	145.00
16	6 "	4 "	3 "	8 "	2 "	Deity	140.00	Demi	200.00

CLOSE TOP TWO-CYLINDER FORCE PUMP.

FOR STEAMBOATS, FACTORIES, RAILROAD STATIONS, ETC.

FIG. 283.



The above is an illustration of one of the most popular Pumps we ever built.

Making them for a long period of years, we have from time to time added such improvements and made such alterations in them as our vast experience has suggested, until, as it is now constructed, we claim there is no equal to it made by any manufacturer.

The Cylinders are closed at the top, so nothing can be thrown into them to injure the Pump.

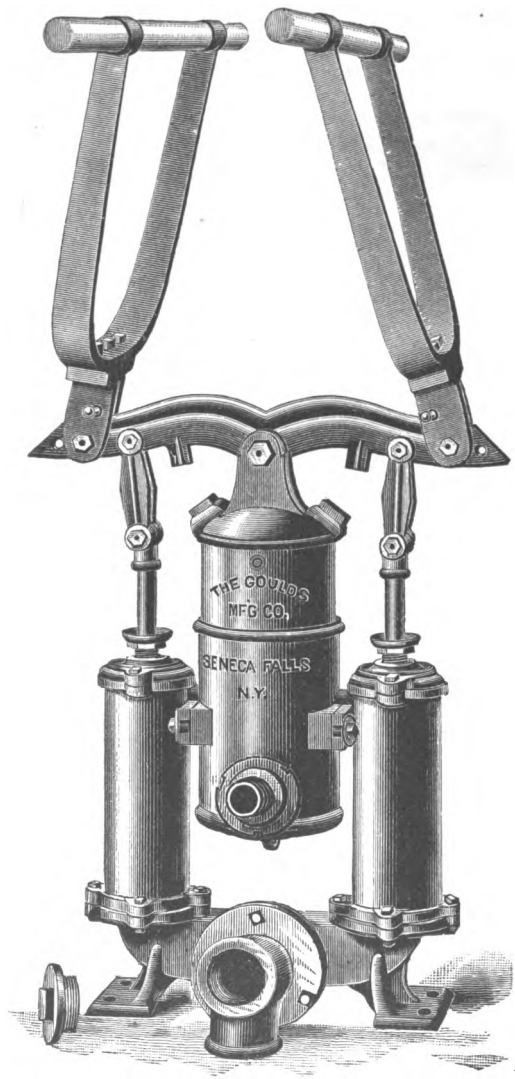
With each Pump belongs a pair of hard-wood levers, long enough for two or four men to work on.

We refer to opposite page for a detailed description of this splendid Pump, as well as for prices of the various sizes.

CLOSE TOP TWO-CYLINDER FORCE PUMP.

WITH FOLDING BRAKES.

FIG. 284.



This is the same Pump as shown under Fig. 283, with folding brakes. The brakes are long enough to admit of four to six men working on them, and with such a power, water can be forced a long distance. A fire taken in its inception, with this engine, could not resist its *dampening* effects, but must succumb.

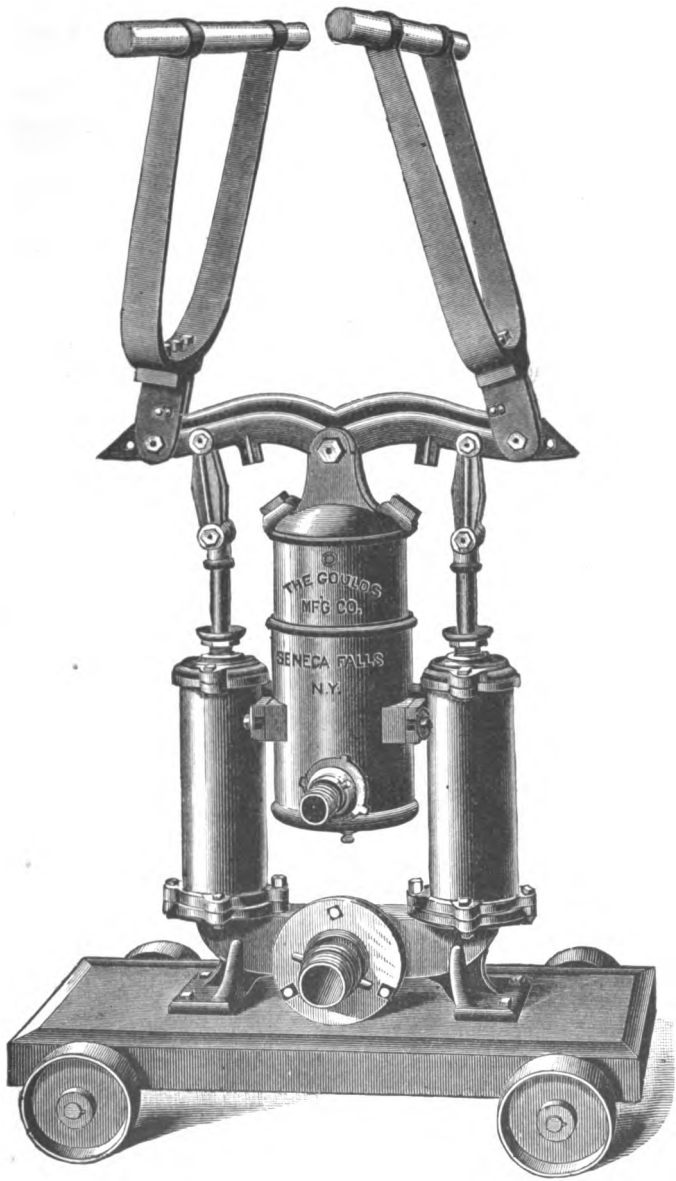
As a protection to any factory, mill, house or depot against fire, we know there is no better Pump.

For prices, capacity, etc., see page 162.

CLOSE TOP TWO-CYLINDER FORCE PUMP.

WITH FOLDING BRAKES, ON PLATFORM WITH WHEELS.

FIG. 285.



This is our Fig. 284, bolted to a platform on wheels, for convenience of transporting from place to place. With a length of spiral suction hose attached to the Pump it is always in readiness to be carried to the place of necessity, and in case of fire will be found invaluable, for it is a very powerful engine when the brakes are fully equipped. For full description and prices of this Pump see page 162.

OPEN TOP TWO-CYLINDER FORCE PUMPS.

The pumps on the two following pages are a new kind of Open Top Two-Cylinder (double action) Force Pumps, of which we construct, in the various styles illustrated, six different sizes.

We build them with iron, brass lined, and all brass Cylinders. The former have iron plungers with double cup leather packings, while both the latter have brass plungers similarly packed.

Those with plain iron Cylinders can be used for pumping fresh water; those with brass linings are as unsusceptible to the action of salines or acids as those with the all-brass Cylinders, and by some are preferred, as they come some cheaper and are stiffer and stronger, and will prove as durable, while the all-brass Cylinders are highly finished and polished and present a very ornamental appearance. The workmanship on all three kinds is unvarying, and the same, and as Pumps, in the abstract, one is just as efficient as the other. For sugar estates, distilleries, etc., we build them entirely of brass or gun metal, as ordered, except the lever beam.

We can recommend these Pumps for any purpose where water is to be drafted from 10 to 25 feet and forced either through pipes to almost any height into tanks, bath rooms, etc., or through hose for watering lawns, extinguishing fires, wetting sails on shipboard, etc.

Brass plugs are in the bed plate for drawing off the water in cold weather.

COMMENDABLE FEATURES.

We will enumerate some of the features that will commend these Pumps to anyone.

1st. The comparatively few pieces composing the Pump.

2d. The facility with which the parts can be separated for repairs and re-adjusted.

3d. The passages are very large and very direct, and conduct the water to the eduction opening with the least possible delay and outlay of power, thereby producing the utmost economy in operation.

4th. The cast-iron plate, forming a seat for lower valves, is bolted on to the side of bed plate, as shown in the cut, at an angle of 45 degrees, consequently a horizontal suction pipe can be screwed in the flange, or by taking out the bolts and transposing the plate a vertical pipe can be used. In setting a Pump this will be duly appreciated, and will often save considerable expense for fittings, etc.

5th. All surfaces are carefully planed to make perfect joints, and are perfectly packed.

6th. All corresponding parts are exactly identical in every Pump. All holes are drilled to perfect templets and all threads cut to accurate gauges. The result is, repairs cannot but be *just right*, and go to the places of the old parts without any fitting.

OPEN TOP TWO-CYLINDER FORCE PUMP.

FOR STEAMBOATS, FACTORIES, WHARVES, ETC., WITH WOOD LEVERS.

FIG. 518.

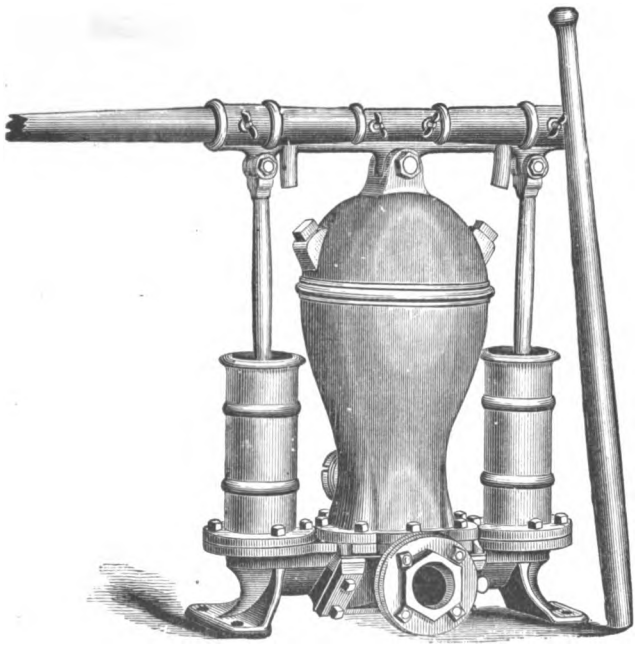


Fig. 518 gives an accurate representation of one of the styles of Pumps described on the preceding page, arranged to be worked either by wood levers, which go with each Pump, or by power, as desired. Rubber buffers on each side of air chamber receive the blow of the lever beam in its downward stroke.

The suction plate is always fitted for wrought-iron pipe, and the discharge opening has a brass tube for wiring on hose. Can fit both ends for wrought-iron pipe, or both ends for hose, if ordered.

The sizes of suction and discharge attachments could be varied if necessary.

FIG. 518. Sizes, Prices, Etc.

No.	Diam. Cyls.	Suction.	Dis.	Capacity per Rev.	IRON CYLINDERS.		BRASS LINED CYLS.		BRASS CYLINDERS.	
					Cipher.	Price.	Cipher.	Price.	Cipher.	Price.
4	3 in.	1½ in.	1¼ in.	2-5 gal.	Hoax	$40.00	Holt	$48.00	Hoot	$65.00
6	3½ "	2 "	1½ "	1-2 "	Hock	45.00	Home	57.00	Hops	78.00
8	4 "	2½ "	2 "	7-8 "	Hod	55.00	Hone	70.00	Hope	95.00
10	4½ "	2½ "	2 "	1 1-10 "	Hoe	67.00	Hood	86.00	Hose	115.00
12	5 "	2½ "	2 "	1 3-8 "	Hold	82.00	Hoof	100.00	Host	140.00
16	6 "	4 "	2½ "	1 3-4 "	Hole	110.00	Hoop	140.00	Hour	170.00

We can furnish this Pump mounted on platform with wheels at $10.00 extra list.

No. 16 is fitted with gun metal valves and valve seats and has 7 inch stroke.

Nos. 4 and 6 have 6½ inch stroke; Nos. 8, 10 and 12 have 8 inch stroke.

OPEN TOP TWO-CYLINDER FORCE PUMP.

FOR STEAMBOATS, FACTORIES, WHARVES, ETC., WITH WROUGHT-IRON FOLDING BRAKES.

FIG. 519.

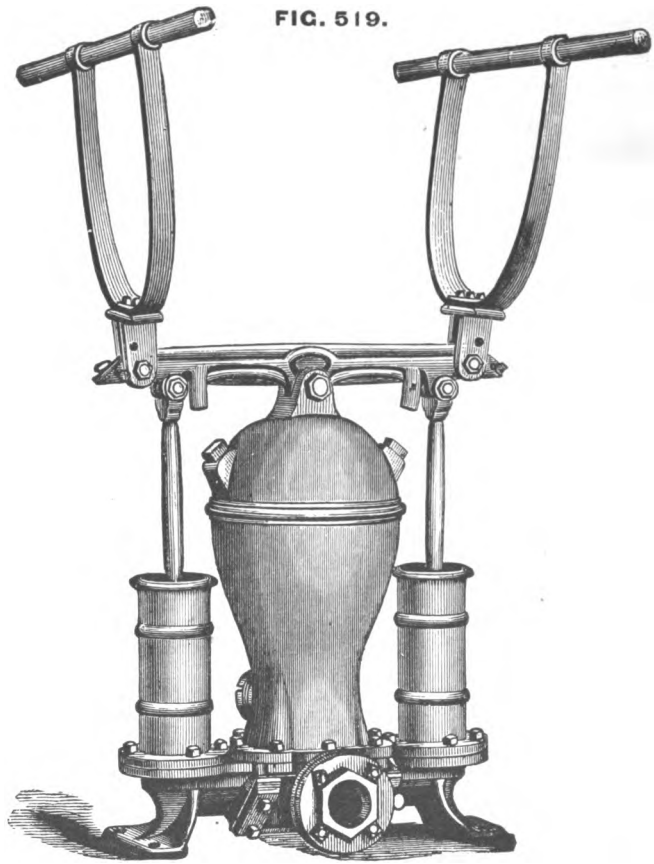


Fig. 519 represents the same Pump we have hitherto explained, with folding brakes. When not in use the turned steel pin can be removed and the brakes folded up out of the way, as illustrated by cut. Six to eight men can be accommodated on these brakes easily, and manipulated by such a power this engine will perform good service, extinguishing fires, and in many other useful capacities. The suction plate is always fitted for wrought-iron pipe and the discharge for hose, unless otherwise ordered.

FIG. 519. Sizes, Prices, Etc.

No.	Diam. Cyls.	Suction.	Dis.	Capacity per Rev.	IRON CYLINDERS.		BRASS LINED CYLS.		BRASS CYLINDERS.	
					Cipher.	Price.	Cipher.	Price.	Cipher.	Price.
4	3 in.	1½ in.	1¼ in.	2-5 gal	Hove	$60.00	Hunt	$68.00	Hymn	$85.00
6	3½ "	2 "	1½ "	1-2 "	Hue	65.00	Hurl	77.00	Ibex	98.00
8	4 "	2½ "	2 "	7-8 "	Huge	75.00	Hurt	90.00	Ibis	115.00
10	4½ "	2½ "	2 "	1 1-10 "	Hulk	87.00	Hush	106.00	Ice	135.00
12	5 "	2½ "	2 "	1 3-8 "	Hum	102.00	Husk	120.00	Idea	160.00
6	6 "	4 "	2½ "	1 3-4 "	Hump	130.00	Hut	160.00	Ides	190.00

We can furnish this Pump mounted on platform with wheels at $10.00 extra list.
No. 16 is fitted with gun metal valves and valve seats, and has seven inch stroke.
Nos. 4 and 6 have 6½ inch stroke; Nos. 8, 10 and 12 have 8 inch stroke.
See page 166 for full description.

OPEN TOP TWO-CYLINDER FORCE PUMP.

WITH WROUGHT-IRON EXTENSION LEVERS.

FIG. 520.

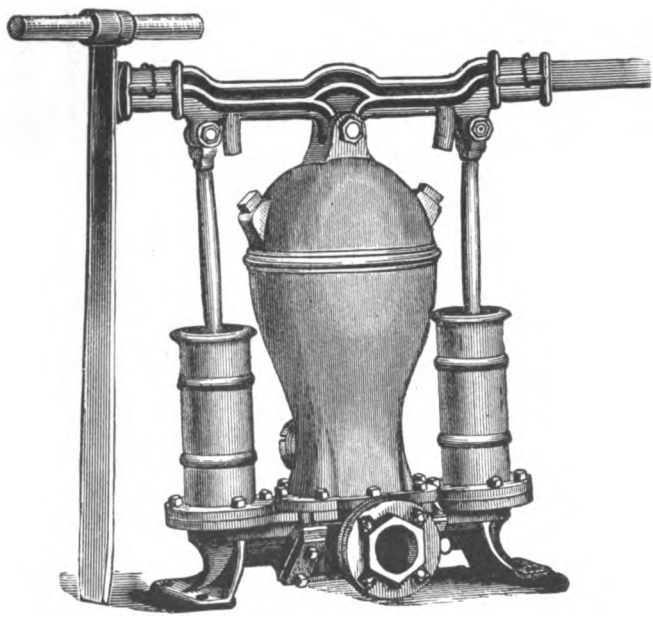


Fig. 520 represents our Two-Cylinder Suction and Force Pump, arranged with wrought-iron extension levers. When these levers are put in place, they afford room for many men to work at and render this Pump a most powerful engine for forcing water on fires or supplying it for many uses about factories, warehouses, wharves, etc.

The Pump is the same in all other respects as our Figs. 518 and 519 delineated on the previous pages and fully described on page 166. The suction plate is always fitted for wrought-iron pipe, and the discharge opening for hose, unless otherwise ordered. We can, however, fit both ends for wrought-iron pipe or both ends for hose, if ordered.

Sizes of suction and discharge attachments could be changed if desired.

FIG. 520. Sizes, Prices, Etc.

No.	Diam. Cyls.	Suction.	Dis.	Capacity per Rev.	IRON CYLINDERS.		BRASS LINED CYLS.		BRASS CYLINDERS.	
					Cipher.	Price.	Cipher.	Price.	Cipher.	Price.
4	3 in.	1½ in.	1¼ in.	2-5 gal.	Visitable	$50.00	Visne	$58.00	Vitalize	$75.00
6	3½ "	2 "	1½ "	1-2 "	Visitant	55.00	Visor	67.00	Vitally	88.00
8	4 "	2½ "	2 "	7-8 "	Visited	65.00	Vista	80.00	Vitals	105 00
10	4½ "	2½ "	2 "	1 1-10"	Visiting	77.00	Visual	96.00	Vitiate	125.00
12	5 "	2½ "	2 "	1 3-8 "	Visitor	92.00	Vital	110.00	Vitious	150.00
16	6 "	4 "	2½ "	1 3-4 "	Visive	120.00	Vitality	150.00	Vitreous	180.00

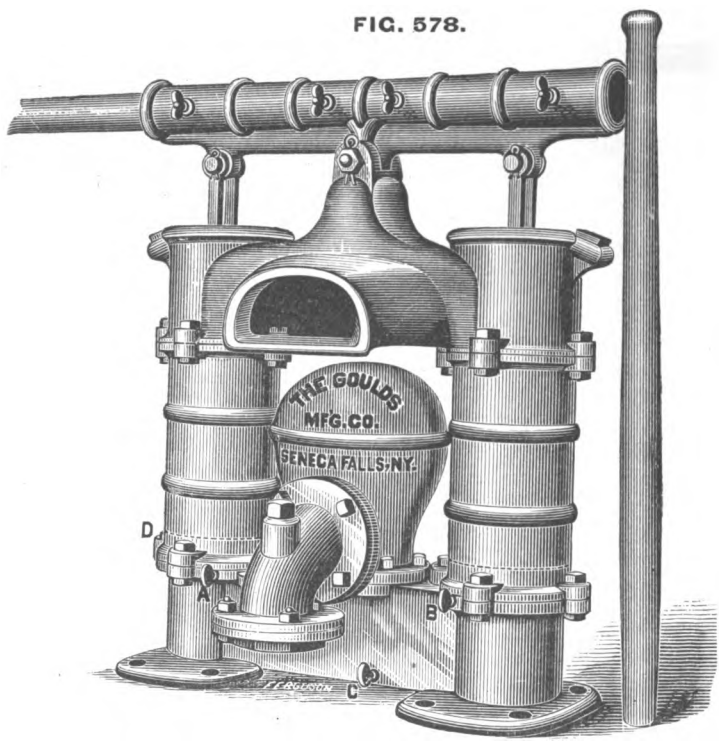
We can furnish this Pump mounted on platform with wheels at $10.00 extra list.

No. 16 is fitted with gun metal valves and valve seats, and has 7 inch stroke. Nos. 4 and 6 have 6½ inch stroke; Nos. 8, 10 and 12 have 8 inch stroke.

IMPROVED SHIP'S MAIN AND BILGE PUMP.

WITH WOOD LEVERS.

FIG. 578.



The above cut represents our improved Ship's Main and Bilge Pump for use upon shipboard, in mines, and upon plantations for irrigation. It has a reversible top, heavy strong bed plate, with brass valve seats cast in the base, poppet valves of new design; the suction pipe is attached to the vacuum chamber above the valves, so that they are always submerged; the bed plate has brass plugs to let the water out to prevent freezing; the plungers are always made of brass, with large waterways, and in Pumps with brass lined cylinders, we put brass valve seats, brass king bolts, and brass thumb screws in levers.

We also furnish two and three turn brass cocks with elbows, where a suction pipe is wanted for each side of the keelson.

The cock with elbows bolt on to flange of bed plate of Pump. The two turn cock is for two suction pipes, and the three turn cock for three suction pipes at once, or only one as required. With each Pump is sent a pair of wood levers, an extra set of crimped plunger packings and a malleable-iron wrench.

FIG. 578. Sizes, Prices, Etc.

Diameter. Cylinders.	Stroke.	Suction.	Capacity per Revolution.	Floor Space.	IRON CYLINDERS.		BRASS LINED CYLS.	
					Cipher.	Price.	Cipher.	Price.
5½ in.	6½ in.	3 in.	1 1-3 gal.	12x24 in.	Lest	$60.00	Lid	$80.00
5½ "	8 "	3 "	1 5-8 "	12x28 "	Let	60.00	Lien	80.00
6 "	8 "	3 "	2 "	12x28 "	Levy	70.00	Maw	90.00

Brass 2-way cock, with 2 elbows for 2 suction pipes, ... $18.00 net
Brass 3-way cock, with 3 elbows for 3 suction pipes, ... 20.00 net

Flanges of cock have oblong holes in them, so the suction pipes can be pushed one side or the other, according to emergency.

IMPROVED SHIP'S MAIN AND BILGE PUMP.

WITH WROUGHT-IRON EXTENSION LEVERS.

FIG. 579.

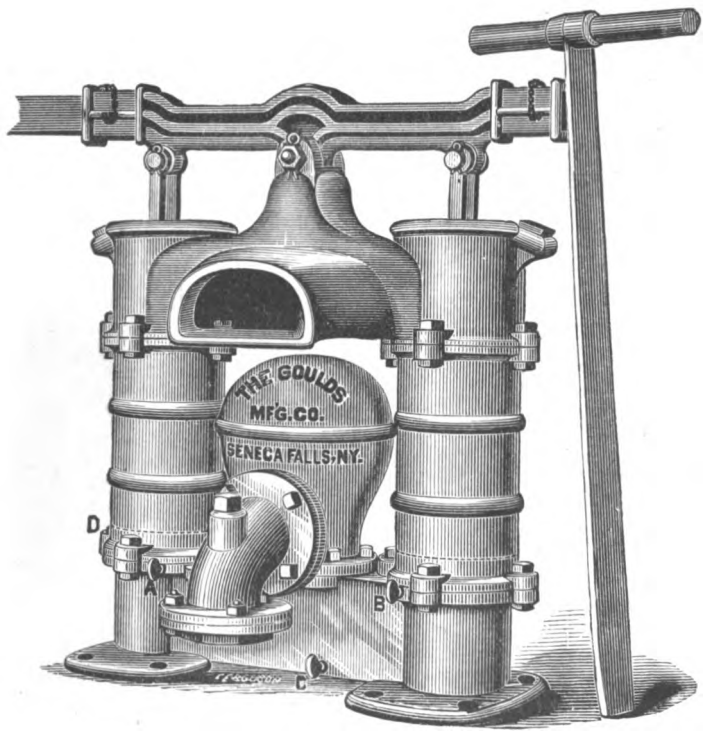


Fig. 579 represents our improved Ship's Main and Bilge Pump arranged with wrought-iron extension levers, so that a large force of men can be employed in operating it.

The above Pump is the same in other respects as Fig. 578, and we would refer to our general remarks on opposite page for description. We have always believed our patrons would agree with us in that "The best is the cheapest," and have spared no expense or labor in making these Pumps well worth their price.

FIG. 579. Sizes, Prices, Etc.

Diameter Cylinders.	Stroke.	Suction.	Capacity per Revolution.	Floor Space.	IRON CYLINDERS. Cipher.	IRON CYLINDERS. Price.	BRASS LINED CYLS. Cipher.	BRASS LINED CYLS. Price.
5½ in.	6½ in.	3 in.	1 1-3 gal.	12 x 24 in.	May	$65.00	Mead	$85.00
5½ "	8 "	3 "	1 5-8 "	12 x 28 "	Maze	65.00	Meal	85.00
6 "	8 "	3 "	2 "	12 x 28 "	Mazy	75.00	Mean	95.00
8 "	8 "	3 "	3 1-2 "	12 x 28 "	Mazer	135.00	Meant	160.00

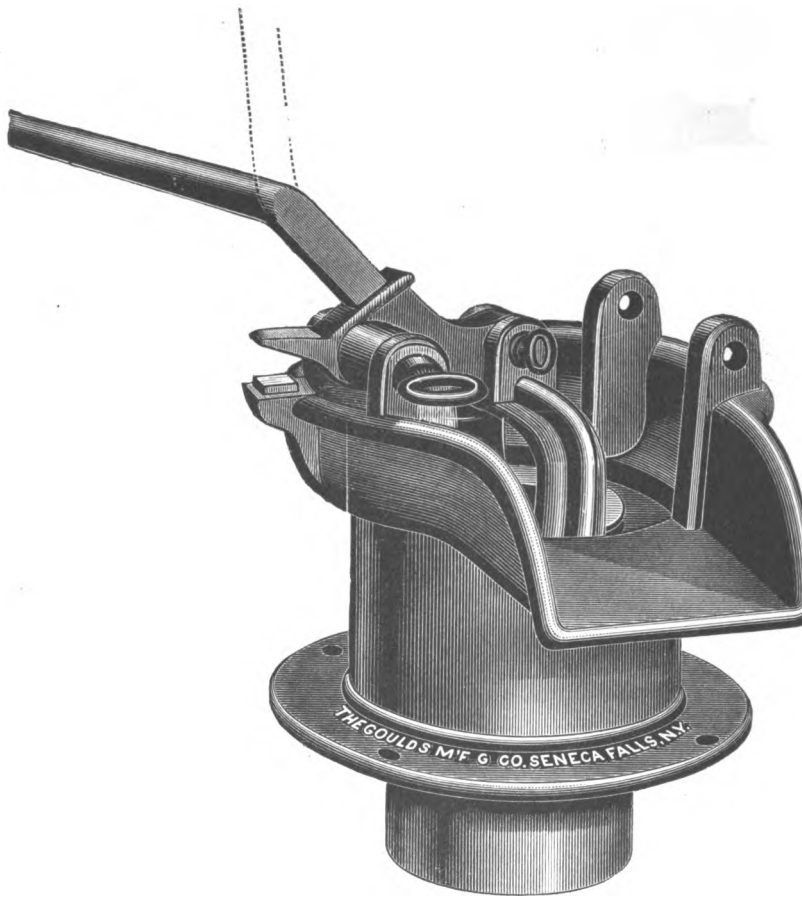
Brass 2-way cock, with 2 elbows for 2 suction pipes, ... $18.00 net
Brass 3-way cock, with 3 elbows for 3 suction pipes, ... 20.00 net

Flanges of cock have oblong holes in them, so the suction pipes can be pushed one side or the other, according to emergency.

THE "DELUGE" BILGE PUMP.

BRASS LINED WITH ADJUSTABLE LEVER.

FIG. 722.



This Pump is designed for shallow or small vessels of not more than 15 to 20 feet depth of hold from the deck; for contractors who wish to pump large quantities of water from excavations, etc., for irrigation or any other purpose where a compact and capacious Pump is desired.

The Cylinder is lined with brass, and the lever socket is made at such an angle that the bent wrought-iron lever when put in one side up is right for ordinary pumping, and by simply changing it to the other side up it becomes a vertical lever. All the working parts are easy of access and repairs can be readily made on shipboard. Always fitted for wrought-iron pipe. We have anticipated for some time building smaller sizes of this excellent Pump and would solicit correspondence concerning same.

FIG. 722. Sizes, Prices, Etc.

Diameter Cylinder.	Suction.	Stroke.	Capacity per Stroke.	Height.	Weight.	Cipher.	Price.
10 in.	3 in.	4½ in.	2-3 gal.	27 in.	162 lbs.	Toilet.	$30.00

STEAM BOILER FEED PUMPS.

As shown by Figs. 482, 483, 484, 485 and 709.

Our new Boiler Pumps, as accurately delineated by the various cuts on the following pages, we offer to the Trade as the most improved and desirable Feed Pumps of the kind built by any manufacturers in this country. They are very compact, the numerous parts are very strong, and what is of prime importance in Pumps of this character, each like piece is the same in every machine. This is the perfection of manufacturing, and we not only claim it in this line of our goods, but in all of them where it is essential and possible for the price we realize for them.

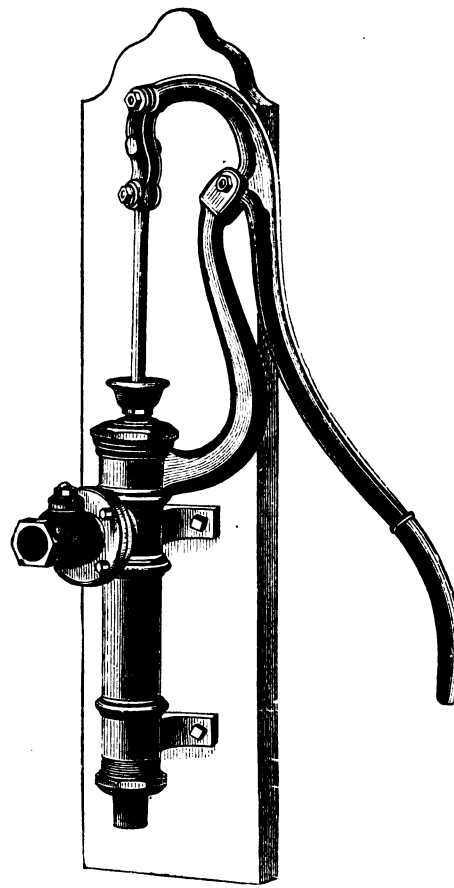
The Pump and column are secured to the bed plate by bolts, making true flanged joints. The holes in the flanges are drilled at four equal parts in the circumference of a circle, so that either one can be moved a quarter, half or full turn, and have the holes in the flanges of bed plate and column of Pump exactly over the other. When pipes are already in position before a Feed Pump is bought, it often happens the suction or discharge pipe is just wrong for the Pump. It is only necessary in such case to take out the bolts and turn the Pump around, which can be done in a few moments, and the pipes and the Pump connected forthwith. The piston is cast brass; the rod malleable iron; the crank shaft has a long bearing filled with Babbitt-metal; the face is highly finished and much preferable to that ordinarily used; the globes have large water passages, so as to admit water freely and without friction; the valves are made of bronze composition, extra heavy and large in diameter, so as to provide the requisite degree of opening with the smallest amount of lift, so obviating the pounding and wearing out incident to high-lifting valves; the connecting tubes vary according to the size of Pump; and what is really the most beneficial improvement over the old Pumps we used to build and those any other makers turn out is, the different sizes Pumps have pulleys of varying diameters and faces commensurate with the work to be performed. And besides, these pulleys are not ground on a grindstone, but are turned up in a lathe, as they should be. We will here mention for the information of those uninformed on these matters, that at least from one-fifth to one-fourth more power can be conveyed to a turned pulley than to a ground one; or, in other words, as much power can be got out of a four-inch belt on a properly finished pulley as can be got out of a five-inch one on a ground pulley.

We desire to call attention to another decided change for the better. In our six-inch stroke Pumps the whole height of the Pump is not on top of the bed plate, for the flange is cast around it about two inches from the bottom, so that all of the Pump below the flange is in the bed plate. Pumps constructed in this manner are much stiffer themselves as well as the column, which does not have to be so long.

We are willing to leave the question of the superiority of Boiler Pumps to the Trade, who know full well a good article when they see it. We give full description and prices on the succeeding pages, to which we invite your attention.

HAND BOILER FEED PUMP, ON PLANK.

FIG. 289.



The cut shows a Boiler Feed Pump for filling still boilers, or feeding those under a moderate pressure of steam. Not but what it is strong enough to force into boilers with a heavy steam pressure, but it is not practicable to do such work for any length of time by hand power. Where boilers are employed for making steam merely, and do not make enough of it to generate any pressure to speak of, these Pumps are very extensively put in use.

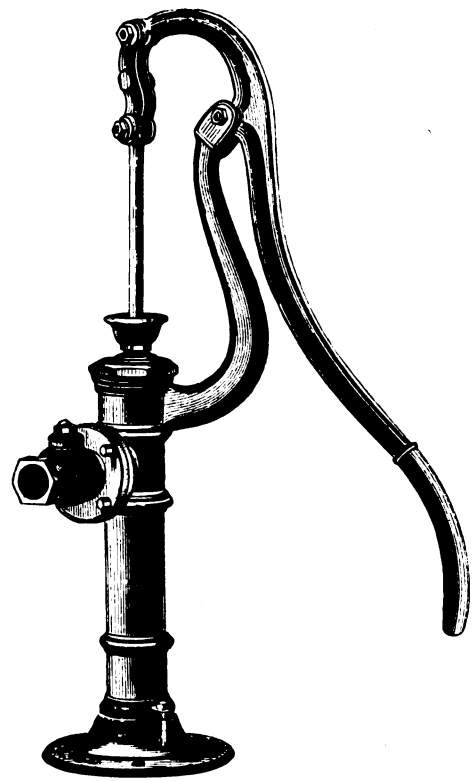
A brass globe check valve in the eduction outlet prevents the water from going back again into the Pump. They are all fitted with metallic fittings throughout for pumping hot as well as cold water. We would advise when pumping hot water that the Pump be placed as near the water as possible. We make three sizes.

FIG. 289. Sizes, Prices, Etc.

No.	Diameter Cylinder.	Suction and Discharge.	Stroke.	Capacity per Stroke.	Height.	Cipher.	Price.
0	2 in.	1 in.	6 in.	1-6 gal.	30 in.	Digit	$12.00
2	2½ "	1¼ "	6 "	1-4 "	30 "	Dike	14.00
4	3 "	1¼ "	6 "	1-3 "	30 "	Dim	16.00

HAND BOILER FEED PUMP, ON BASE.

FIG. 495.



The cut shows a Boiler Feed Pump, on Base. It is adapted to the same purposes as Fig. 289, on opposite page, and we therefore solicit your attention to the previous page for explanation of its use, etc.

We make three sizes of this style.

FIG. 495. Sizes, Prices, Etc.

No.	Diameter Cylinder.	Suction and Discharge.	Stroke.	Capacity per Stroke.	Height.	Cipher.	Price.
0	2 in.	1 in.	6 in.	1-6 gal.	29½ in.	Head	$12.00
2	2½ "	1¼ "	6 "	1-4 "	32 "	Heal	14.00
4	3 "	1¼ "	6 "	1-3 "	32 "	Heap	16.00

NEW STYLE STEAM BOILER FEED PUMP.

FIG. 485.

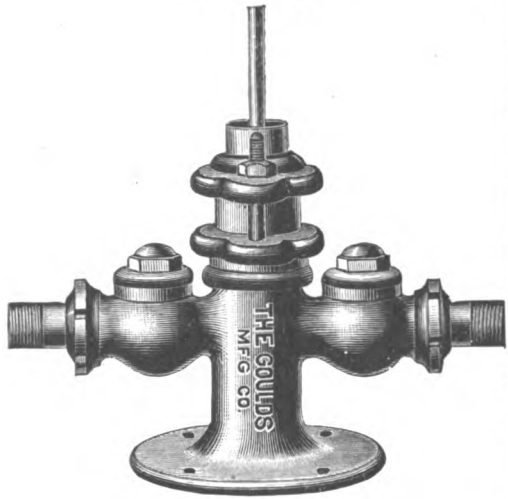


FIG. 485. Sizes, Prices, Etc.

No.	Diam. Cyl.	Stroke.	Suction and Dis.	Strokes per Minute.	Gallons per Minute.	Cipher.	Price.
2	1¼ in.	6 in.	¾ in.	40	1.27	Hall	$10.00
3	1½ "	6 "	"	40	1.84	Halo	15.00
4	1½ "	3 "	"	60	1.37	Halt	14.00
5	2 "	3 "	1 "	60	2.45	Hame	18.00
6	2½ "	3 "	"	60	3.82	Hand	22.00
7	3 "	3 "	1¼ "	60	5.50	Hank	27.00
8	2 "	6 "	1¼ "	40	3.26	Hard	22.00
9	2½ "	6 "	1¼ "	40	5.10	Hare	30.00
10	3 "	6 "	1½ "	40	7.35	Hark	40.00

The above cut represents our new style of Steam Boiler Feed Pump for power. It is the same in principle as the Pump on opposite page, but differs somewhat in form and proportion.

HAND PRESSURE PUMP.

FIG. 293.

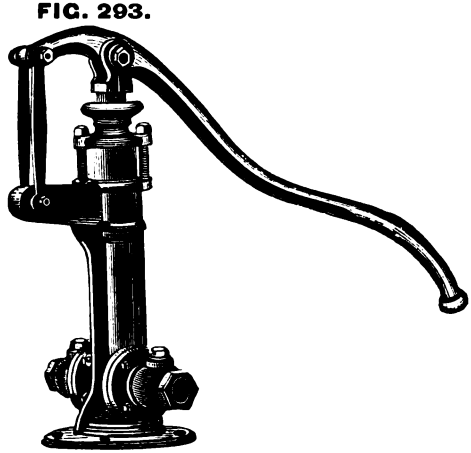


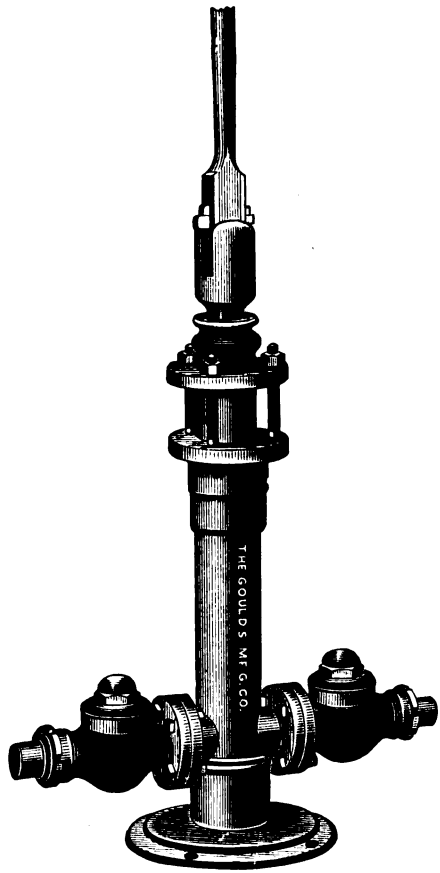
Fig. 293 represents a Pump for generating cold-water pressure up to 300 pounds to the square inch, and, with additional leverage and made heavier, can be made to work up to 600 pounds pressure. This is not calculated for a suction and lift Pump, as the piston is too small, but should be placed where the water is about on level with the Pump, or only a short distance below it. For testing the condition of boilers, pipes or vessels of any kind, this will be found very useful and thoroughly practical. We make three sizes.

FIG. 293. Sizes, Prices, Etc.

No.	Diameter Cylinder.	Suction and Discharge.	Stroke.	Cipher.	Price.
0	¾ in.	1 in.	6 in.	Dinner	$22.50
1	1¼ "	1 "	6 "	Dint	25.00
2	1½ "	1 "	6 "	Dip	30.00

STEAM BOILER FEED PUMP.

FIG. 292.



The cut, Fig. 292, represents our Steam Boiler Feed Pump for supplying steam boilers with water against any pressure. This is the best Boiler Pump made. The globe-check valves are made of separate castings (see cut), faced off and bolted on the body of Pump by a tight-packed joint. The valve seats are made of best bronze and screwed into the iron castings, and can therefore be removed when worn out and other new ones inserted. The valve itself is also of bronze. The stuffing box, top of piston and stub end are finished bright and polished.

FIG. 292. Sizes, Prices, Etc.

No.	Diameter Cylinder.	Suction and Discharge.	Stroke.	Strokes per Minute.	Gallons per Minute.	Cipher.	Price.
00	1½ in.	1 in.	9 in.	60	4.13	Dime	$30.00
0	2 "	1¼ "	9 "	60	7.35	Din	35.00
2	2½ "	1¼ "	9 "	60	11.47	Dine	40.00
4	3 "	1½ "	9 "	60	16.52	Dingy	50.00

STEAM BOILER FEED PUMP.

WITH COLUMN, GUIDE AND PITMAN, FOR POWER.

FIG. 709.

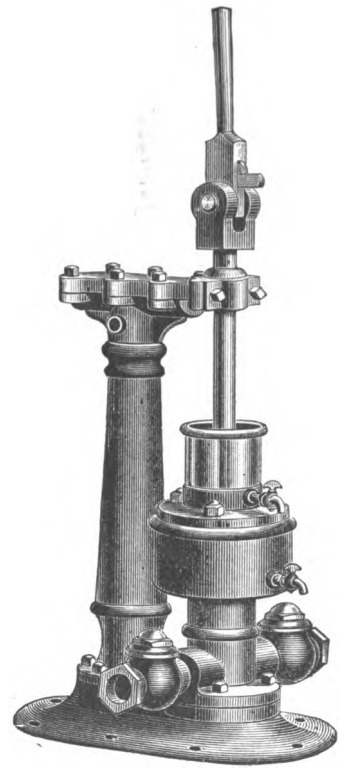


Fig. 709 represents a Steam Boiler Feed Pump, mounted on base, with gun-metal globe valves, water chamber on cylinder and also on stuffing box, with the proper drips. This combination makes one of the most perfect Pumps we have ever produced for this purpose, the greatest pains being taken with every part.

FIG. 709. Sizes, Prices, Etc.

No.	Diameter Cylinder.	Suction and Discharge.	Stroke.	Strokes per Minute.	Gallons per Minute.	Cipher.	Price.
0	2 in.	1¼ in.	6 in.	40	3.27	Scrag	$80.00
2	2½ in.	1¼ in.	6 in.	40	5.10	Scrap	90.00
4	3 in.	1½ in.	6 in.	40	7.35	Screw	100.00

STEAM BOILER FEED PUMP, ON BED PLATE.

WITH COLUMN AND SINGLE PULLEY, FOR HAND OR POWER.

FIG. 482.

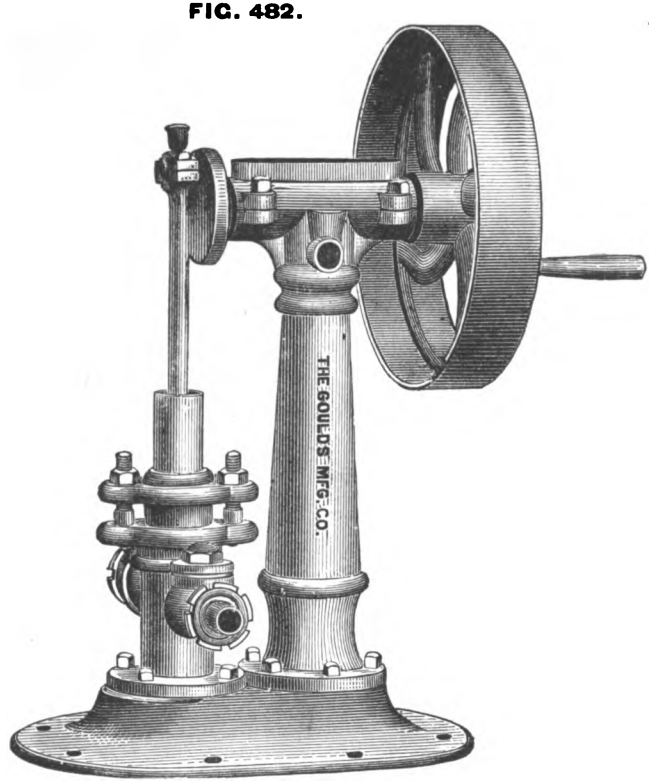


Fig. 482 represents our Steam Boiler Feed Pump on bed plate, with column, crank shaft, face plate and single pulley, with iron handle for hand or power use.

One of the chief advantages of this style of Pump is the ease with which it can be fastened to its place on the floor. The Pump and column being perfectly in line with each other—only the bed plate requires leveling.

This Pump will feed boilers under any steam pressure. We always recommend the shortest possible suction pipe to a Feed Pump, as there is not so much danger of its losing its priming. See page 173 for further description.

FIG. 482. Sizes, Prices, Etc.

No.	Diam. Cyl.	Suction and Discharge.	Stroke.	Strokes per Minute.	Gallons per Minute.	Pulley.	Floor Space.	Cipher.	Price.
0	2 in.	1 in.	3 in.	60	2.45	16 x 4 in.	17 x 25 in.	Gull	$30.00
2	2½ "	1 "	3 "	60	3.82	18 x 4 "	17 x 25 "	Gully	38.00
4	3 "	1¼ "	3 "	60	5.51	20 x 4 "	19 x 27 "	Gulp	48.00

STEAM BOILER FEED PUMP, ON BED PLATE.

WITH COLUMN AND TWO PULLEYS, FOR HAND OR POWER.

FIG. 483.

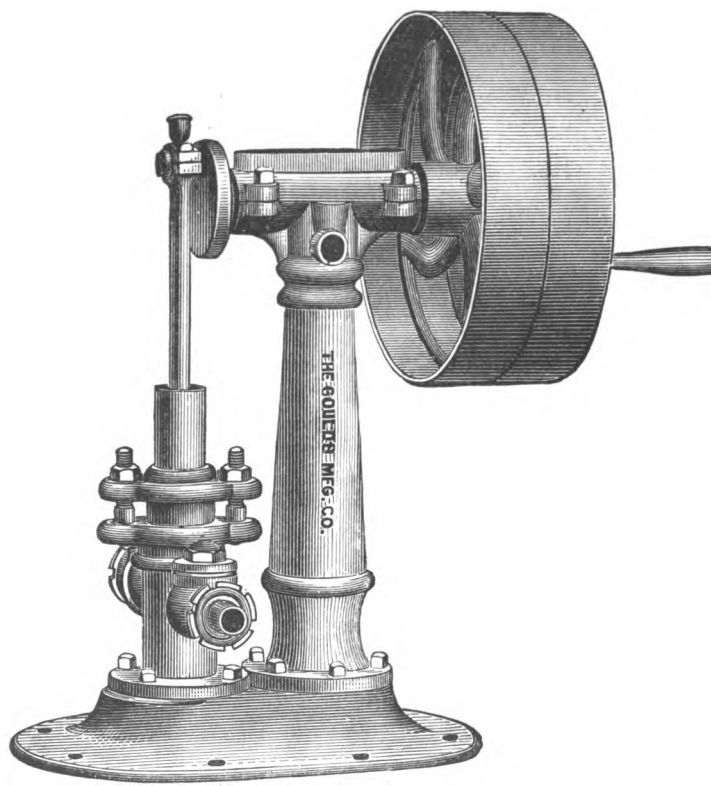


Fig. 483 represents another Steam Boiler Feed Pump on bed plate, with column, face plate, etc., and a tight and loose pulley. The driving one is farthest from the Pump, and is provided with an iron handle, and can be used to work the Pump before steam is up, which is often required, after blowing off a boiler. These Pumps are as substantial as one of the kind can be built, and have given the best of satisfaction where employed.

See page 173 for further description.

FIG. 483. Sizes, Prices, Etc.

No.	Diam. Cyl.	Suction and Discharge.	Stroke.	Strokes per Minute.	Gallons per Minute.	Pulleys, each.	Floor Space.	Cipher.	Price.
0	2 in.	1 in.	3 in.	60	2.45	16 x 4 in.	17 x 30 in.	Gust	$34.00
2	2½ "	1 "	3 "	60	3.82	18 x 4 "	17 x 30 "	Guy	40.00
4	3 "	1¼ "	3 "	60	5.51	20 x 4 "	19 x 30 "	Habit	50.00

Both pulleys have screws for fastening to crank shaft.

STEAM BOILER FEED PUMP, ON BED PLATE.

WITH COLUMN AND TWO PULLEYS, FOR HAND AND POWER.

FIG. 484.

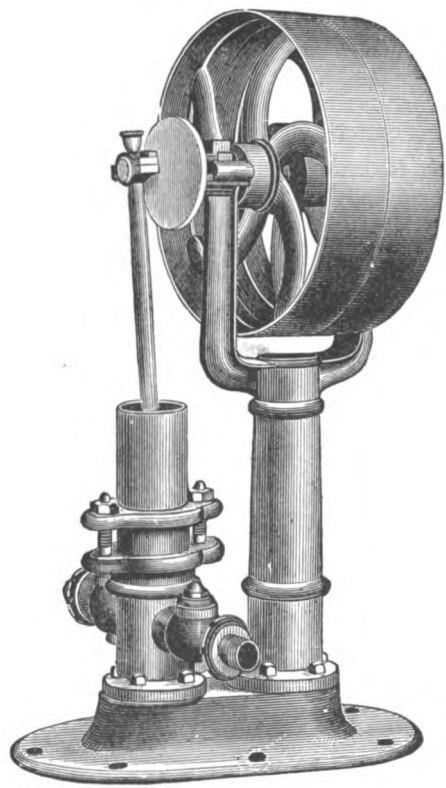


Fig. 484 shows an entirely new and improved pattern of Steam Boiler Feed Pump, with crank shaft, face plate and tight and loose pulleys. The cut conveys a very distinct idea of the construction of the Pump, which every mechanic will at once concede to be built upon the proper principle. The bearings in which the shaft revolves are close up to the pulleys on each side, and are sustained by strong supports, or arms, spreading out from the top of the column.

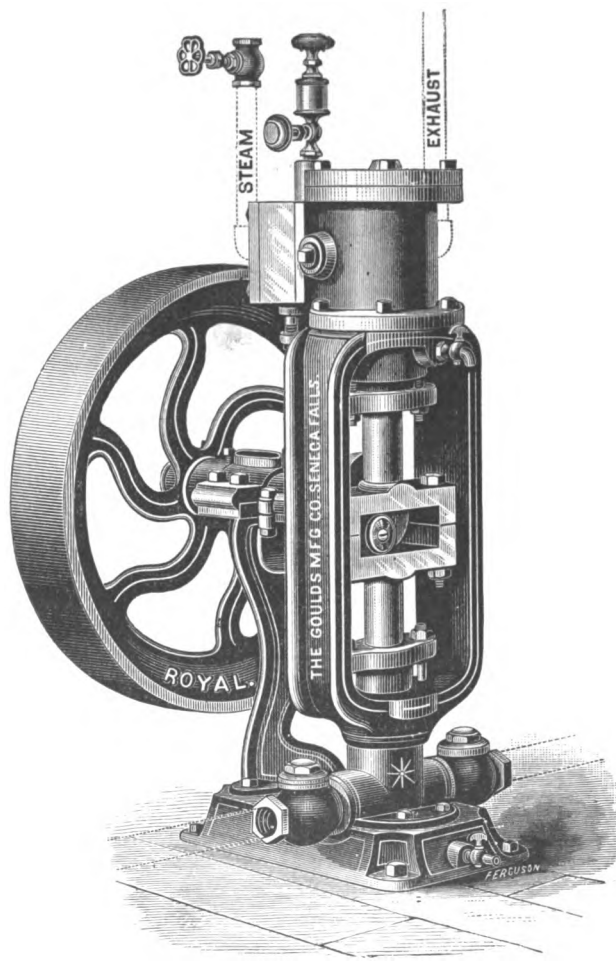
On the end of driving shaft, opposite the face plate, is a heavy iron crank with wrought handle for working the Pump when necessary before steam is up. The cut does not show it, nevertheless it is there, and is a great improvement to this Pump. See page 173 for further particulars.

FIG. 484. Sizes, Prices, Etc.

No.	Diameter Cylinder.	Suction and Discharge.	Stroke.	Strokes per Minute.	Gallons per Minute.	Pulleys, each.	Floor Space.	Cipher.	Price.
0	2 in.	1 in.	3½ in.	60	2.45	16 x 4 in.	17 x 21 in.	Hair	$34.00
2	2½ in.	1 in.	3½ in.	60	3.82	16 x 4 in	17 x 21 in.	Hale	40.00
4	3 in.	1¼ in.	3½ in.	60	5.51	16 x 4 in.	19 x 21 in.	Half	50.00

"ROYAL"
INDEPENDENT STEAM BOILER FEED PUMP.

FIG. 687.



Floor Space and Pipe Measurements.

No. of Pump.	Floor Space.	Height base to top of steam chest.	Height above floor to centre suction and discharge pipes.	Height from floor to centre of steam pipe.	Height from floor to centre of exhaust pipe.	Distance each way from centre line of pump to outside of suction and discharge valves.	Distance from centre line of cylinder to out end of shaft.	Distance each way from centre line of cylinder to outside of exhaust opening.	Distance from centre line of cylinder to steam inlet.
1	19 x 22 in.	33 in.	2⅝ in.	26½ in.	26½ in.	7¾ in.	14 in.	2½ in.	6¾ in.
2	19 x 22 "	33 "	2⅝ "	26½ "	26½ "	7¾ "	14 "	2¾ "	7¼ "
3	22 x 26 "	35 "	3 "	30¼ "	30¼ "	8 "	14⅜ "	3⅛ "	7⅝ "
4	22 x 28 "	35 "	3¼ "	32¾ "	30¼ "	8¾ "	14⅜ "	3½ "	8 "
5	22 x 28 "	38 "	3¼ "	33¼ "	30¼ "	9 "	14⅜ "	3⅝ "	8¼ "
6	23 x 36 "	38 "	5¼ "	39 "	36 "	10⅝ "	15¼ "	4⅛ "	9¼ "

For description and prices see opposite page.

"ROYAL"

INDEPENDENT STEAM BOILER FEED PUMP.

FIG. 687.

The "Royal" is a new and improved Independent Boiler Feeder, designed by our mechanical engineer, after a critical examination of all other feeders, and therefore has many points of merit in its arrangement, construction and proportions not found in any of the numerous ones now offered in the market. It is very simple and substantial, composed of few parts, and all parts so made that duplicates can be supplied for repairs with absolute certainty of interchanging.

The main or frame casting, with supporting arm, is all in one piece, so that the shaft revolves in perfectly rigid bearings, while the eccentric connection works in a vertical line, without any lateral pressure on the valve rod to heave and pull the steam chest, cramp the rod and create friction. The cylinder heads have ground surfaces; the space between cylinder and chest is tapped on either side for the exhaust steam pipe, and the brass globe check valves are each designated "suction" or "discharge" for convenience, and can be connected on either side of Pump, if necessary. If water is to be raised by suction, put a foot-valve and strainer on end of suction pipe and make all joints tight.

Engineers all say that the GOULD "ROYAL" is the most substantial, best proportioned and modern in its general construction and arrangement of parts, of any of the large number of Single-Acting Boiler Feed Pumps, and always give it the preference over all others.

We can make these Pumps with brass plungers, if so desired, and line the cylinders with brass, also, at extra price.

Every Pump is fully guaranteed.

The exhaust pipe can be connected to either side of steam cylinder.

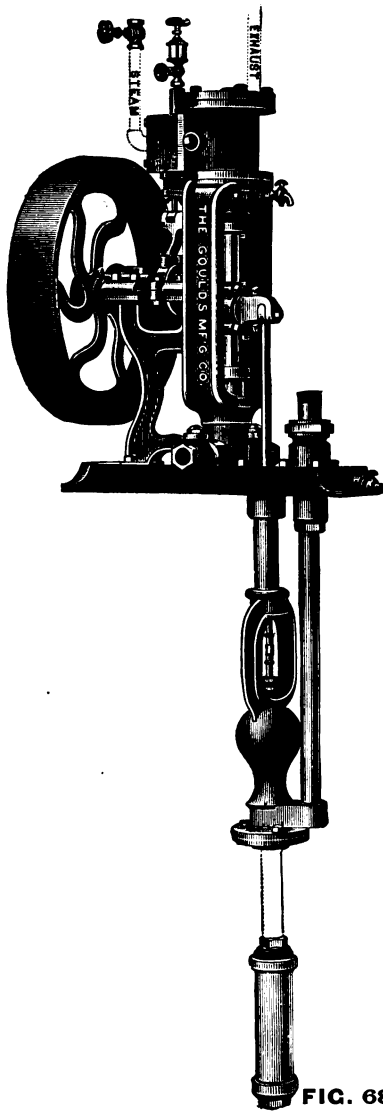
The table below will give a full description of diameter, capacity, prices, etc., of these Pumps.

FIG. 687. Sizes, Prices, Etc.

No.	Diam. Steam Cyl.	Diam. Water Pl'ger.	Stroke.	Steam Pipe.	Exhaust Pipe.	Water Pipes.	Rev. per Min.	Gallons per Minute.	Size of Boiler.	Cipher.	Price.
1	3 in.	1⅜ in.	3 in.	⅜ in.	¾ in.	1 in.	100	1.93	15 H. P.	Sago	$44.00
2	3½ "	1¾ "	3 "	½ "	¾ "	1 "	100	3.12	27 H. P.	Sail	55.00
3	4 "	2¼ "	4 "	¾ "	1 "	1¼ "	90	6.20	46 H. P.	Sake	70.00
4	4½ "	2¾ "	4 "	¾ "	1 "	1½ "	85	8.75	62 H. P.	Salad	82.50
5	5 "	3½ "	4 "	¾ "	1¼ "	1½ "	80	13.33	106 H. P.	Sale	110.00
6	6 "	4 "	5 "	1 "	1½ "	2 "	75	21.75	164 H. P.	Salt	154.00

With each Pump we furnish Throttle Valve, Oil Cup and Let-off Plugs.

"ROYAL"
INDEPENDENT STEAM BOILER FEED PUMP.



WITH EXTENSION FOR WELLS.

FIG. 688.

This cut shows our "Royal" Steam Boiler Feed Pump, with extension or set length below the bed plate, so that it can be operated in wells; pumping cold water into a tank and then forcing into the boiler at the same time. For a full description of the "Royal" Steam Boiler Feed Pumps, as made by us, see our Fig. 687, page 183. The combination as shown in this cut will be greatly appreciated by those who have to obtain their water from wells. The sizes and prices we give below. The prices include all as shown in the cut, except the gas pipe and rods between the air chamber and lower cylinder; these we furnish according to the depth of the well. We can make the water plunger of the Steam Pump of brass, if so desired; also, line the cylinder with brass, at extra expense.

The lower cylinder is fitted for wrought-iron pipe.

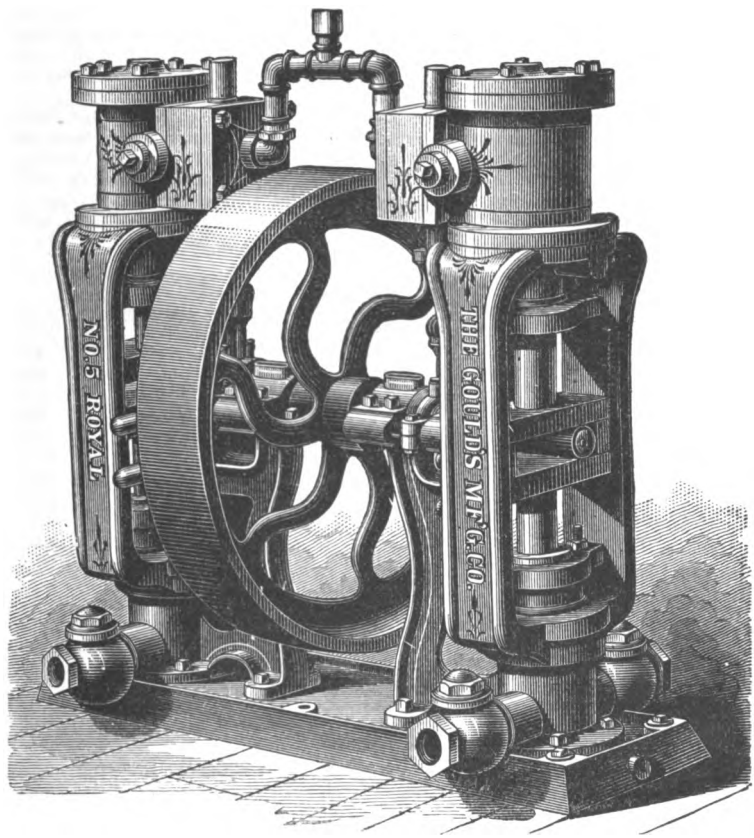
With each Pump we furnish Throttle Valve, Oil Cup and Let-Off Plugs.

FIG. 688. Sizes, Prices, Etc.

No.	Diam. Steam Cyl.	Dia. Water Plunger.	Stroke.	Steam Pipe.	Exhaust Pipe.	Water Pipes.	Revolutions per Minute.	Gallons per Minute.	Size of Boiler.	Diameter of Lower Cyl.	Cipher.	Price.
1	3 in.	1⅜ in.	3 in.	⅜ in.	¾ in.	1 in.	100	1.93	15 H.P.	1½ in.	Hear	$62.00
2	3½ "	1¾ "	3 "	½ "	¾ "	1 "	100	3.12	27 H.P.	2 "	Heat	73.00
3	4 "	2¼ "	4 "	¾ "	1 "	1¼ "	90	6.20	46 H.P.	2½ "	Heel	90.00
4	4½ "	2¾ "	4 "	¾ "	1 "	1½ "	85	8.75	62 H.P.	3 "	Heft	103.50
5	5 "	3½ "	4 "	¾ "	1¼ "	1½ "	80	13.33	106 H.P.	3½ "	Heir	130.00

"ROYAL"
DUPLEX STEAM BOILER FEED PUMP.

FIG. 700.



The above cut represents our Duplex "Royal" Steam Pump. Being two Fig. 687 bolted or joined together, having one heavy balance wheel, and mounted on heavy iron base. For further description we refer to Fig. 687, page 183. We can either connect the steam pipes together, so as to use one supply pipe of double the capacity of a single Pump, or can leave them separate, and can do the same with the exhaust pipes. We give below sizes and prices, as follows:

FIG. 700. Sizes, Prices, Etc.

No.	Diam. Steam Cyls.	Diam. Water Pl'gers.	Stroke.	Size of Steam Pipes.	Size of Exhaust Pipes.	Size of Supply Pipes.	Rev. per Min.	Gallons per Minute.	Size of Boiler.	Cipher.	Price.
1	3 in.	1⅜ in.	3 in.	⅜ in.	¾ in.	1 in.	100	3.86	30 H. P.	Sting	$ 88.00
2	3½ "	1¾ "	3 "	½ "	¾ "	1 "	100	6.24	54 H. P.	Stint	110.00
3	4 "	2¼ "	4 "	¾ "	1 "	1¼ "	90	12.40	92 H. P.	Stir	140.00
4	4½ "	2¾ "	4 "	¾ "	1 "	1½ "	85	17.50	124 H. P.	Stock	165.00
5	5 "	3½ "	4 "	¾ "	1¼ "	1½ "	80	26.66	212 H. P.	Stoic	220.00
6	6 "	4 "	5 "	1 "	1½ "	2 "	75	43.50	328 H. P.	Stone	308.00

With each Pump we furnish Throttle Valves, Oil Cups and Let-off Plugs.

FEED PUMPS FOR BOILERS.

We are often written to in regard to the size of Feed Pump to use for pumping water into steam boilers of different sizes. This is a very difficult question to answer with the small amount of data usually accompanying such inquiries, and, indeed, unless one is actually on the ground to observe the condition under which the engine is running, it is not very easy to name a formula that will give an accurate estimate of the steam an engine is consuming. Two engines may be exactly similar in all respects, and yet the quantity of steam used by one will vary materially from the other, for a variety of reasons which we will not mention here.

The subjoined table gives the quantity of water that several of the most common sizes of engines would require in a boiler to make steam enough to run them, while the formula will assist in making computations for other sizes not named. Our figures are based on the supposition that the engines and boilers are perfect in every part, no leakage of the valves or piston, and engine working full stroke. For ordinary engines from 10 to 25 per cent. should be added, and then buy a Pump capable of feeding double the actual quantity of water required, and you will be secure.

TABLE No. 1.

Bore.	Stroke.	Rev. per Minute.	Pressure.	Cubic inches Steam.	Cubic feet Steam.	Cubic inches Water.
6 in.	10 in.	150	80 lbs.	84810	49.	272
7 "	12 "	150	80 "	138528	80.16	453
8 "	12 "	150	80 "	180974	104.73	592
9 "	12 "	150	80 "	229032	132.54	749
10 "	15 "	125	80 "	294825	170.44	963
11 "	18 "	100	80 "	352108	203.76	1152
12 "	24 "	80	80 "	434227	251.28	1420
13 "	24 "	80	80 "	509683	294.95	1667
14 "	28 "	80	80 "	689651	399.10	2255
15 "	30 "	70	80 "	742224	429.52	2427

FORMULA.

Ascertain the area of engine piston (see page 7) and multiply it by number of inches per minute piston travels, which will give the capacity of cylinder in cubic inches of steam. Divide this product by 1728 (number of cubic inches in cubic foot) and you will get the number of cubic feet of steam. This result multiply by the coefficient set opposite the steam pressure the engine is working under (see table below) and you will have the number of cubic inches of water per minute required to make the steam.

EXAMPLE.

How much water per minute will be required to supply with steam an engine 10-inch cylinder, 15-inch stroke, running 125 revolutions, with a pressure of 80 lbs. of steam to the square inch? Multiply area $78.54 \times 15 \times 250 = 294525 \div 1728 = 170.44$ cubic feet of steam. Multiply this by 5.65 and you get 965 cubic inches of water as the amount required.

TABLE No. 2.

Table giving quantity of water that will produce 1 cubic foot of steam under various pressures.

At	10 pounds	pressure	1.7	cubic inches water will make	1 cubic	foot steam.
At	15	"	2.	" "	1 "	"
At	20	"	2.3	" "	1 "	"
At	25	"	2.6	" "	1 "	"
At	30	"	2.9	" "	1 "	"
At	35	"	3.2	" "	1 "	"
At	40	"	3.5	" "	1 "	"
At	45	"	3.8	" "	1 "	"
At	50	"	4.	" "	1 "	"
At	55	"	4.3	" "	1 "	"
At	60	"	4.6	" "	1 "	"
At	65	"	4.8	" "	1 "	"
At	70	"	5.1	" "	1 "	"
At	75	"	5.31	" "	1 "	"
At	80	"	5.65	" "	1 "	"
At	90	"	6.2	" "	1 "	"
At	100	"	6.68	" "	1 "	"

HAND AND POWER ROTARY FORCE PUMPS.

Figs. 297 and 297½, on the following pages, are our Hand Rotary Force Pumps with balance wheels. These Pumps will *lift* water as far as any piston Pump, and work against any pressure ranging from, say, 10 to 50 pounds, discharging a constant stream of water, or other fluid, at any desired point remote from the Pump. The whole inside working and principle of the Pump are obvious from the sectional illustration of the cams, which mash into each other. See Fig. 299. These are variously employed in cisterns and wells, pumping hot or cold water, wines, liquor, or other ascetious fluids; filling still boilers, or those working under a moderate steam pressure; in fact, it is difficult to enumerate the services they are capable of rendering. Again, as if there was no limit to the application of these Pumps, gas companies have got to employing them for testing their main pipes, carrying them easily to the piece of pipe to be tested, which is much more convenient than the cumbrous apparatus used heretofore. A small thread is cut on the extremity of the spout, whereon hose can be coupled and water thrown from 75 to 100 feet with ease. When wanted for pumping hot liquids it is necessary that we should be advised of it, as we put in a metallic valve in that case. Bronze Pumps should always be used for distilleries, malt houses, etc.

INTERNAL SECTION CUTS OF OUR ROTARY PUMPS.

FIG. 299.

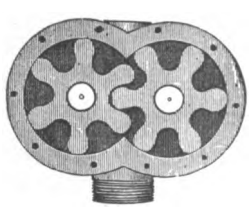
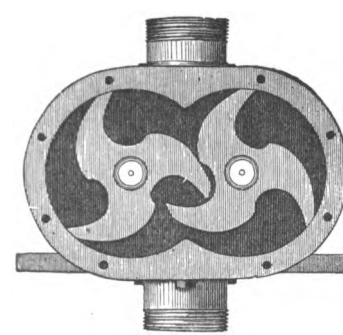


FIG. 300.



The above cuts show the internal arrangement of our Rotary Pumps, Fig. 299 cams being used in our Figs. 297, 297½, 298, 464 and 665; while Fig. 300 cams are used in Figs. 301, 302 and 302½. The peculiar formation of these revolving cams or pistons was acquired after long experimenting and successful practice, and has demonstrated them to be of such a shape as to produce the very minimum of friction and wear, with the greatest results.

HAND ROTARY FORCE PUMP.

WITH LIGHT BALANCE WHEEL.

FIG. 297.

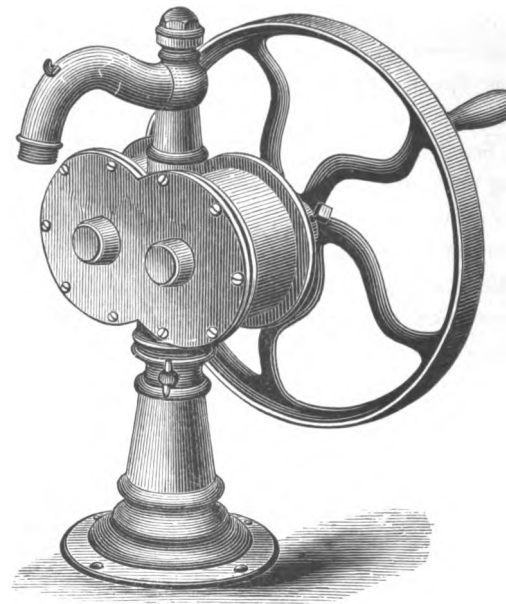


Fig. 297 represents our Hand Rotary Force Pump, described on previous page, arranged on base, with light balance wheel. They are adapted for every place or purpose where a Lift and Force Pump can be used, and will pump from a well or cistern, or can be moved to any place where water is not more than 15 to 20 feet distance and operated instantly. They will pump equally as well hot water by the addition of a metallic lower valve. For wine or liquor a bronze Pump should always be used, as it is unaffected by the action of acids. We would also advise the use of a check valve at end of suction pipe as it keeps the pipe always filled and renders the pump ready for use with a single revolution. Our Rotary Pumps are known in every country of the world as the very best made. They have no competitors, are alone reliable, and always give satisfaction.

FIG. 297. Sizes, Prices, Etc.

No.	Suction.	Dis.	Diameter Balance Wheel.	Rev. per Minute.	Gallons per Minute.	IRON.		BRONZE.	
						Cipher.	Price.	Cipher.	Price.
1	1¼ in.	1 in.	14½ in.	100	13	Ditty	$19.00	Dizzy	$41.00
2	1¼ "	1 "	14½ "	100	14	Dive	22.00	Dock	46.00
3	1½ "	1¼ "	14½ "	100	17	Divan	26.00	Dodge	51.00

LARGE HAND ROTARY FORCE PUMP.

WITH HEAVY BALANCE WHEEL.

FIG. 297 1-2.

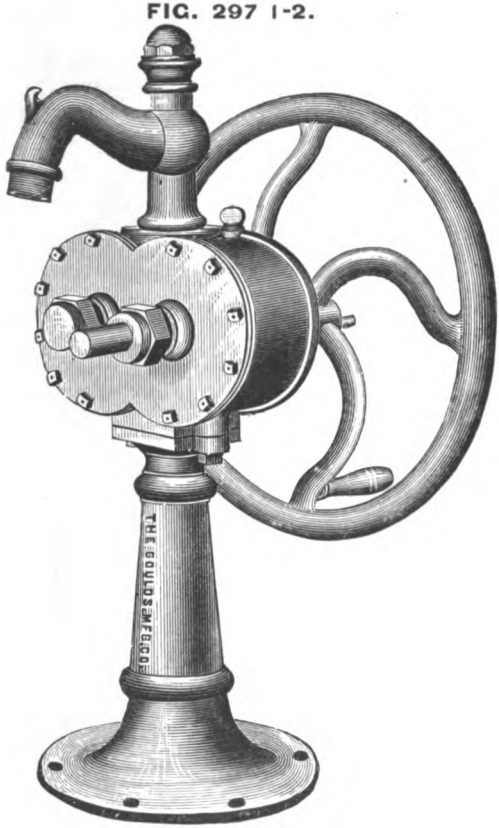


Fig. 297½ shows a Hand Rotary Pump of large capacity and power. This Pump will be found of rare usefulness, as it can be worked by two men with great results. The cam shaft is long enough to put another fly wheel on, so that four men can work if necessary. Brass plugs are at top and bottom of case for letting out the water in cold weather. After taking out the plugs reverse the cams two or three times around, so as to get the water down from the top.

This Pump will carry off large quantities of water in a very short time. By removing the goose neck the No. 5 Pump will take 2 inch gas pipe for vertical discharge, but no other sizes can be treated this way. The sizes of suction and discharge pipes can be changed to suit the requirements of customers if desired.

FIG. 297 1-2. Sizes, Prices, Etc.

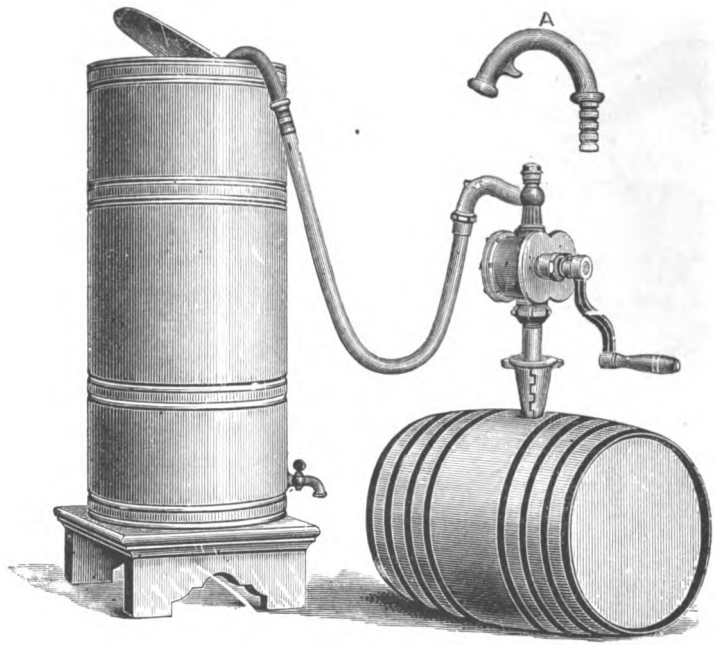
No.	Suction.	Dis.	Diameter Balance Wheel.	Revolutions per Minute.	Gallons per Minute.	IRON.		BRONZE.	
						Cipher.	Price.	Cipher.	Price.
1	1¼ in.	1 in.	20 in.	100	13	Doe	$20.00	Dole	$42.00
2	1¼ in.	1 in.	20 in.	100	14	Doff	23.00	Dome	47.00
3	1½ in.	1¼ in.	20 in.	100	17	Dog	27.00	Don	52.00
4	1½ in.	1½ in.	20 in.	100	27	Dogma	35.00	Done	65.00
4A	1½ in.	1½ in.	36 in.	100	27	Dogskin	39.00	Doit	69.00
5	2 in.	2 in.	20 in.	100	36	Doing	40.00	Doom	75.00
5A	2 in.	2 in.	36 in.	100	36	Doily	44.00	Dolce	79.00
6	2 in.	2 in.	36 in.	100	45	Voidness	50.00	Voiture	100.00

We can furnish this Pump fitted for attaching hose at side, same as shown on Fig. 537, page 202, if so ordered, at same list price.

HAND ROTARY BARREL PUMP.

WITH IMPROVED BARREL ATTACHMENT, OR HOLDER.

FIG. 464.



The cut shows one of our celebrated Hand Rotary Pumps, arranged with an improvement for holding the suction pipe of the Pump rigid in the bung of a barrel. The holder is a tapering sleeve in two halves, and can be used in barrels having any size of bung, from one and a half to four inches in diameter, and will not impair the shape of the bung in the least degree. A suction pipe of three feet in length goes with each Pump, as well as a hose-coupling. With this apparatus fluids of any character or consistency can be pumped from a barrel, tierce or hogshead, and forced into a reservoir or receptacle at any distance removed, to the point desired. Our Rotary Pumps have *two* cams and consequently operate much easier than with one cam, and with less friction.

The prices given below include suction pipe, hose coupling, hook and holder.

Brass suction pipe furnished at extra prices.

Always fitted for hose at discharge unless otherwise ordered.

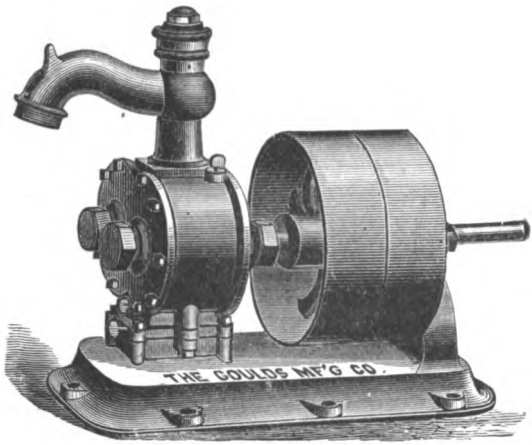
FIG. 464. Sizes, Prices, Etc.

No.	Suction.	Discharge.	Revolutions per Minute.	Gallons per Minute.	IRON.		BRONZE.	
					Cipher.	Price.	Cipher.	Price.
1	1 in.	1 in.	100	13	Girth	$17.00	Glade	$39.00
2	1 "	1 "	100	14	Gist	20.00	Glare	44.00
3	1¼ "	1¼ "	100	17	Give	24.00	Glass	49.00

ROTARY FORCE PUMP, ON FRAME.

WITH TIGHT AND LOOSE PULLEYS.

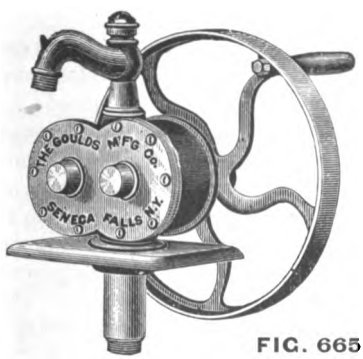
FIG. 298.



This cut accurately represents our Rotary Force Pump on heavy cast iron frame, with tight and loose pulleys for power. Its internal construction is exactly similar to that of Figs. 297 and 297½, previously described, and arranged this way it is capable of constant and productive work. Beyond the pulleys is a strong bearing with babbitt-lined boxes that the driving shaft runs in. This shaft is made of the best steel, and the whole Pump finished with that care and labor which only can make good Pumps of this kind. The shaft is also made long enough to take a balance wheel on end of it, beyond the bearing, but this wheel is only furnished when ordered. For all places where a running supply or large quantity of water is wanted for watering yards, lawns, or supplying waterworks, we know of no better Pump for the money. It is also well adapted as a small Fire Pump, and will throw water from 125 to 150 feet horizontally.

FIG. 298. Sizes, Prices, Etc.

No.	Suction.	Dis.	Pulleys, each.	Rev. per Minute.	Gallons per Minute.	IRON. Cipher.	IRON. Price.	BRONZE. Cipher.	BRONZE. Price.
1	1¼ in.	1 in.	2½ x 8 in.	100	13	Dore	$27.00	Doth	$49.00
2	1¼ "	1 "	2½ x 8 "	100	14	Doric	32.00	Doubt	56.00
3	1½ "	1¼ "	2½ x 8 "	100	17	Dose	38.00	Dough	63.00
4	1½ "	1½ "	3½ x 12 "	100	27	Dot	48.00	Douse	78.00
5	2 "	2 "	3½ x 12 "	100	36	Dote	54.00	Dove	90.00



HAND ROTARY FORCE PUMP.

FIG. 665.

The cut shows one of our celebrated Hand Rotary Force Pumps, arranged on a flat base or plate, 7 x 10 inches, with a cast-iron hub projecting 4 or 5 inches below it.

We always fit both suction and discharge for hose coupling unless otherwise ordered, but can fit them also for gas pipe, if so advised.

FIG. 665. Sizes, Prices, Etc.

No.	Suction.	Dis.	Diameter Balance Wheel.	Rev. per Minute.	Gallons per Minute.	IRON. Cipher.	IRON. Price.	BRONZE. Cipher.	BRONZE. Price.
1	1¼ in.	1 in.	14½ in.	100	13	Luck	$19.50	Lung	$41.50
2	1¼ "	1 "	14½ "	100	14	Luff	22.50	Lure	46.50
3	1½ "	1¼ "	14½ "	100	17	Luke	26.75	Lush	51.75
4	1½ "	1½ "	20 "	100	27	Lull	36.50	Lute	67.00
5	2 "	2 "	20 "	100	36	Lump	42.00	Mace	77.50

POWER ROTARY FORCE PUMPS.

We desire to call the especial attention of all those who need a Power Pump to the cuts on following pages, which represent Rotary Pumps we are now making, of great power and compactness.

For distilleries and manufactories of every kind, where a constant and large supply of water is needed, and as a safeguard against fire, the Rotary strongly commends itself as superior to all other Pumps.

We have been engaged in building Rotary Pumps for a period of thirty years, and have had sufficient experience to *know* there is virtue in them. We have placed them in mills and factories to be used as a protection against fire; in distilleries for pumping hot liquors; in salt wells for pumping salt water—operating in the last two instances months at a time without cessation; in cities and villages for supplying water to reservoirs; in slate and stone quarries for removing muddy and gritty water, as well as for various other purposes; and we do not hesitate to stake our reputation as manufacturers, and say they have *always* given good satisfaction and results. They are from 20 to 30 per cent. cheaper than any other Rotary. They have heavy cast-steel shafts, with outside bearings and Babbitt-metal boxes, with two pairs of heavy gears, to relieve the cams. They are built in a good, workmanlike manner, and we unhesitatingly recommend them as a first-class Pump in every respect.

For the use of breweries and other establishments, where the corrosion of iron Pumps renders them objectionable, we make of bronze, to order.

POWER ROTARY FIRE PUMPS.

Practice and experience are daily demonstrating that the Rotary Pump stands without a peer as a protection against the ravages of fire. Large disastrous fires have become frightfully and ruinously frequent of late, and will continue to be, so long as those who have the needed facilities—water or steam power—to place their property almost beyond the possibility of destruction by this means, remain either ignorant of or indifferent to this adequate and essential safeguard, our Rotary Fire Pump. A small outlay, comparatively, which in a short time would be reimbursed by the saving in insurance, will purchase a stationary Rotary, and the expense of connecting it to machinery is very small indeed.

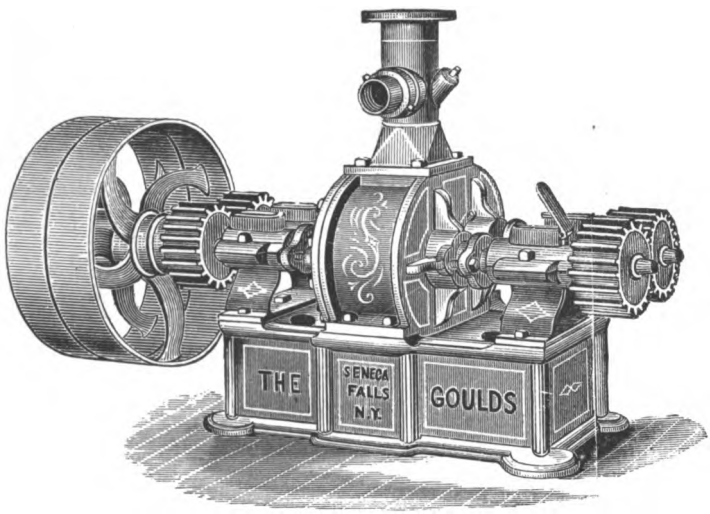
Once set, you have a Pump always ready on the shortest notice to throw one or two streams on the incipient fire. These Pumps are powerful enough to throw a stream to reach fire in the most remote and elevated portions of a building, as they will force water from 150 to 250 feet horizontally, or even further if run at high enough speed. Our Fire Pumps are built of the best materials and in the most substantial manner, recognizing the vital importance of having apparatus that *can't* fail to respond to the exigencies of such critical occasions. The engravings on the following pages represent faithfully these celebrated Pumps, and we consider we are doing the public a favor in attracting their notice to this admirable medium for the preservation of both life and property.

Want of space prevents our giving the many testimonials we have received of the valuable services these Pumps have rendered, but we will mail our special Rotary catalogue, containing much additional information, to any anticipating using one of these Pumps.

POWER ROTARY FORCE PUMP.

ON FRAME WITH TIGHT AND LOOSE PULLEYS.

FIG. 301.



The above cut represents one of our large power Rotary Force Pumps mounted on heavy cast-iron frame, with two sets of heavy cut gears and tight and loose pulleys for power. The internal construction of this Pump is fully illustrated and explained under Fig. 300, page 187, and our many years of experience and observation have devised nothing better for this class of Pumps. The cams are fitted to each other with the greatest care, and the cases that receive them made as true and perfect as the best tools and machinery can render them. The shafts are made of cast-steel and heavy enough to resist almost any pressure, while the boxes in which they run are lined with extra Babbitt-metal.

The pulleys are turned and polished and have a heavy outside bearing beyond the end (although not shown in cut), which relieves all strain upon the shaft.

The suction and discharge openings are fitted for both cast-iron and wrought-iron pipe, as they are flanged for the one and screwed on the inside for the other.

In the table given below will be found the capacity of these Pumps and about the speed they should be run, although they could be run much faster if desired, with greater results.

FIG. 301. Sizes, Prices, Etc.

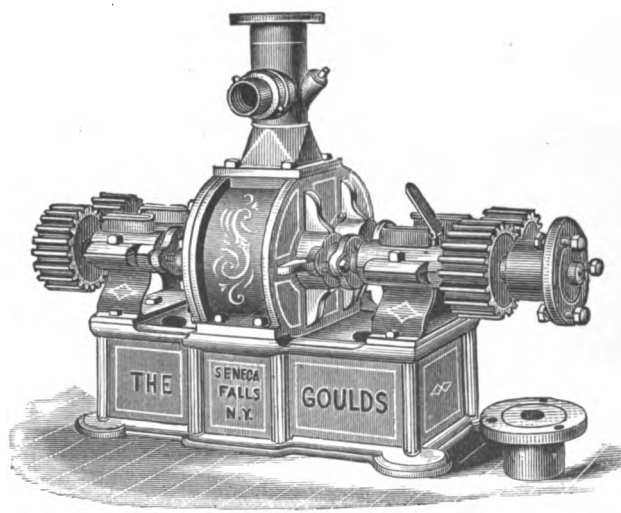
No.	Suction.	Dis.	Pulleys.	Revolutions per Minute.	Gal. per Rev.	IRON.		BRONZE.	
						Cipher.	Price.	Cipher.	Price.
1	2 in.	1½ in.	3½ x 12 in.	225 to 250	¼	Dowdy	$100.00	Doze	$160.00
2	2½ "	2 "	4 x 15½ "	175 to 200	½	Down	115.00	Dozen	180.00
3	3 "	2½ "	5 x 17½ "	150 to 175	1	Dowry	160.00	Dozy	260.00

☞ Keep the bearings well oiled, and after using pour a little good oil into it and turn the cams around a few times, to prevent rusting while standing still. Any of our Power Rotary Pumps can be used for fire service.

POWER ROTARY FORCE PUMP.

ON FRAME, WITH COUPLING ON EACH END OF DRIVING SHAFT.

FIG. 302.



The above cut represents another of our Power Rotary Force Pumps as we build them in the larger sizes, mounted on frame, with two heavy sets cut gears and coupling on each end of driving shaft, for power connection. This coupling connection is perhaps better shown in the cut of Fig. 302½, on opposite page, as it is shown there as we ship them and ready for use. For large Power Force Pumps, or Fire Pumps, we would always recommend the use of gears, with direct shaft connection, over that of belt power, as there is less liability of accident, which is often so ruinous in times of danger. However, where it is not practicable to make a connection of this kind we can furnish counter shaft, pulleys and outside bearings which may be placed any distance from the Pump and in a perfectly protected place. Every Pump is thoroughly tested and put in practical operation before leaving our works, and we will guarantee each to be all we claim for them, perfect Pumps, or ask no pay.

In the table below will be found the capacity of these Pumps and about the speed they should be run, although they may be run much faster without injury, with greater results.

The suction and discharge openings are fitted for both cast-iron and wrought-iron pipe.

Below we give prices in iron, although we can build as well of bronze, if ordered, at an increase in price.

FIG. 302. Sizes, Prices, Etc.

No.	Suction.	Discharge.	Revolutions per Minute.	Gallons per Revolution.	Size Frame.	Width and Length Over All.	Cipher.	Price.
2	2½ in.	2 in.	175 to 200	½	12 x 22 in.	14 x 36 in.	Drag	$115.00
3	3 "	2½ "	150 to 175	1	15 x 25 "	18 x 37 "	Drain	160.00
4	5 "	4 "	125 to 150	1⅔	18 x 31 "	21 x 47 "	Drake	225.00
5	6 "	5 "	100 to 125	2½	19 x 32 "	22 x 47 "	Dram	275.00

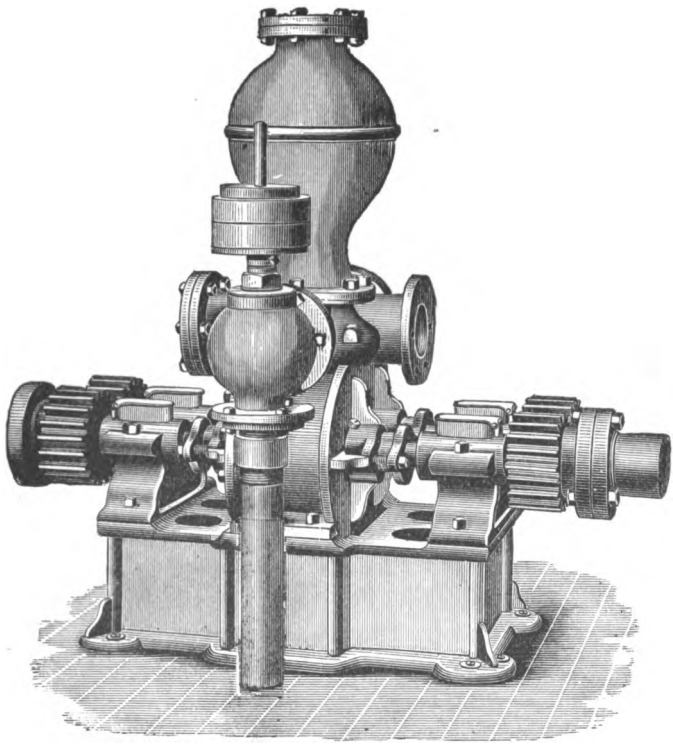
Counter shaft, pulleys and outside bearings, for No. 4, ... $30.00
" " " No. 5, ... 40.00

After using, pour some oil in Pump and turn cams a few times to prevent rusting while not in use.

POWER ROTARY FIRE PUMPS.

WITH AIR CHAMBER AND SAFETY VALVE.

FIG. 302 1-2.



The cut gives a representation of one of our Rotary Pumps, built especially for the protection of mills, factories, warehouses, etc., against fire. We recommend running these Pumps by gears, as belts cannot be relied on in case of fire. We can furnish parties with all the necessary apparatus to take water in pipes all over any building, with openings in each story for attaching hose. Once provided with a good fire Pump means are *instantly* afforded for throwing one or more powerful streams of water on the fire when it first breaks out, which is *the time* to save property.

The speed given in table below may be increased without injuring the Pump, and is only given as a fair estimate for daily use.

The suction and discharge openings are fitted for both cast-iron and wrought-iron pipe. We solicit correspondence concerning these admirable Pumps, and will cheerfully furnish estimates on any contract and fully guarantee every Pump sent from our works.

FIG. 302 1-2. Sizes, Prices, Etc.

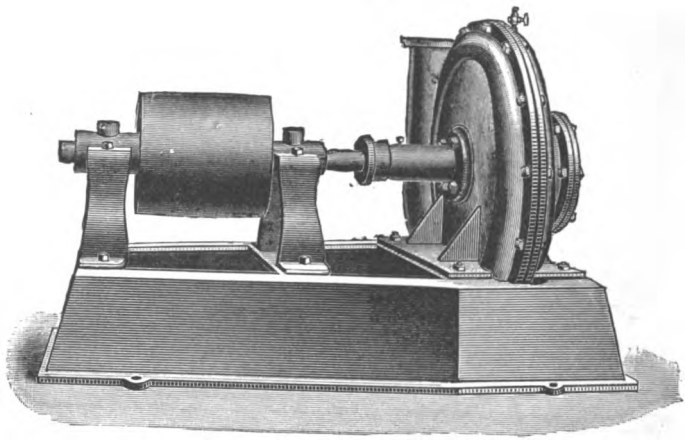
No.	Suction.	Discharge.	Revolutions per Minute.	Gallons per Revolution	Size Frame.	Width and Length Over All.	Cipher.	Price.
3	3 in.	2½ in.	150 to 175	1	15 x 25 in.	24 x 37 in.	Dregs	$172.00
4	5 "	4 "	125 to 150	1⅔	18 x 31 "	27 x 37 "	Dress	240.00
5	6 "	5 "	100 to 125	2½	19 x 32 "	28 x 47 "	Drift	300.00

Safety valves for any of above sizes of Pumps, ... extra net $15.00

We can supply either rubber, leather or linen hose at lowest rates for first-class goods. We have a special hose made for our Fire Pumps able to stand any amount of pressure. We can also furnish hose couplings, discharge pipes, hose wrenches, etc. See pages 232 and 233 for prices.

HORIZONTAL CENTRIFUGAL PUMP.

FIG. 695.



The cuts on this and the following page represent our Improved Horizontal Centrifugal Pumps, for use in tanneries, paper mills, breweries, distilleries, etc. These are the same as a vertical Pump resting on its edge securely fastened to an iron bed frame by flanges cast on each shell. Upon what would be bottom of vertical, but back shell of horizontal, is cast a short pipe with flange to bolt to side of junk or flume, or to induction pipe. The shaft runs horizontally with bearing at either end of pulley. This Pump must be set so that water will flow into it, unless a Foot Valve is used in bottom of induction pipe, in which case it may be set not to exceed twenty-eight feet above the water. In construction the Pumps are all alike, being cast in two halves or shells, with flanges, which are bolted together. The piston revolves in these shells secured to shaft. The cut shows a right-handed Pump. If wanted left-handed, be sure to state it in your order.

DIRECTIONS.

Bolt Pump to the floor; see that the shaft does not bind; RUN IN DIRECTION OF SCROLL. If Pump is set above water make joints in pipe tight and fill Pump with water until suction pipe and Pump are full.

FIG. 695. Sizes, Prices, Etc.

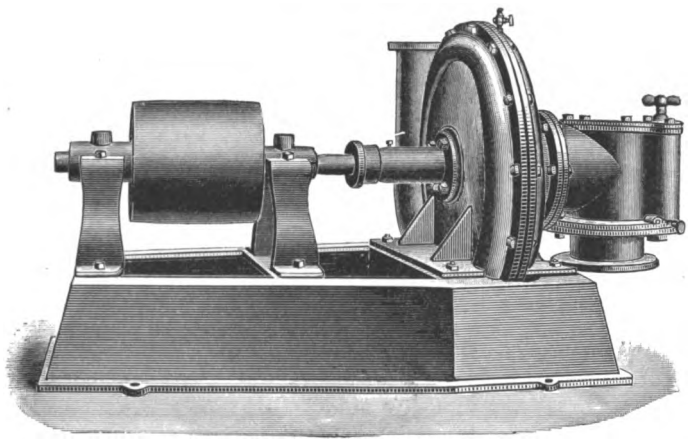
No.....	1¾	2	3	4	6	8	10	12	15	18
IRON	Mane 50.00	Many 70.00	Mar 95.00	Mare 130.00	Mark 200.00	Marl 310.00	Mars 395.00	Mart 500.00	Mash 710.00	Mask 1000.00
BRASS ...	Mass 100.00	Mast 125.00	Mat 175.00	Mate 275.00	Maul 410.00					

For table showing number of revolutions per minute necessary to raise water to different heights, with different sizes of Pumps, see opposite page.

HORIZONTAL CENTRIFUGAL PUMP.

WITH PRIMER FOR SUCTION PIPE.

FIG. 696.



This cut represents our Horizontal Centrifugal Pump, with the addition of a primer for priming by hand. This style is used where Pump sets above water. Our new hand primer is so arranged that there is but one valve; this valve can be reached in a moment by taking out two cap screws and removing plate. The primer is the simplest, most efficient, and easiest working in use. It is perfect. We make a Power Primer for large Pumps.

To put this Pump in operation, observe the same rule as in Horizontal, on opposite page. Then work primer, open pet cock in top of scroll, and continue working until water flows out of pet cock and Pump is full. Close pet cock and start Pump. Primer need not be used but once where the water is forced above Pump, as it holds its priming. Use discharge pipes full size of bore of Pump, and still larger suction.

This cut represents our Pump running right handed. If left-hand Pump is wanted state so particularly in ordering, otherwise we ship right-hand Pumps.

FIG. 696. Sizes and Prices.

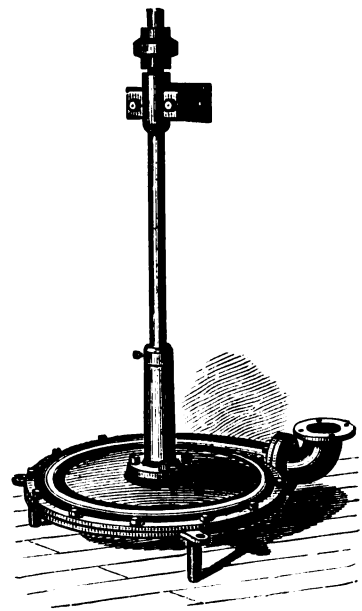
No. . .	1¾	2	3	4	6	8	10	12	15	18
IRON, .	Oval. 60.00	Oven. 85.00	Over. 110.00	Oxen. 155.00	Oyer. 240.00	Pace. 375.00	Pack. 470.00	Page. 600.00	Pail. 850.00	Pain. 1250.00
BRASS, .	Pair. 120.00	Pall. 150.00	Palm. 210.00	Pane. 330.00	Pang. 495.00					

Table showing number of revolutions per minute necessary to raise water to different heights with the different sizes of Pumps.

No. of Pump.	Capacity per Minute.	Size of Discharge Pipe.	Diameter of Pulley.	FIGS. 694, 695 and 696. REVOLUTIONS PER MINUTE.									
No.	Gallons.	Inches.	Inches.	6 ft.	8 ft.	10 ft.	12 ft.	16 ft.	20 ft.	25 ft.	30 ft.	35 ft.	40 ft.
1¾	200	1¾	6	425	590	680	725	825	900	975	1050	1120	1170
2	300	2	7	400	450	525	575	650	720	780	852	908	960
3	650	3	7	350	400	425	450	500	550	650	775	850	910
4	1250	4	10	275	300	350	400	450	500	600	675	800	890
6	2600	6	12	200	220	240	300	360	420	490	540	580	610
8	4750	8	15	185	200	225	250	310	360	390	425	450	475
10	7500	10	18	166	188	220	245	285	320	360	386	414	436

VERTICAL AND SUBMERGED CENTRIFUGAL PUMP.

FIG. 694.



The cut represents an Improved Vertical or Submerged Centrifugal Pump, especially adapted to the use of contractors and engineers for draining lock pits, sewers, etc., and also for pumping tan liquor from junks, or still slop, in fact, for any use where submerged Pumps can be used. These Pumps are constructed without valves, hence will raise water containing sand, gravel, clay, coal, tan bark or other impurities. They will also pump still slop, brewers' mash, and pulp as readily as clear water, and will not clog or get foul.

DIRECTIONS.—Set Pump so that each leg has a perfect bearing; set shaft to side of frame work, and see that it does not bind, but turns easily in the bearings and relieves the step of weight of shaft by collars at bearings and hub of Pump. It makes no difference which way main shaft runs, as the quarter twist in belt can be made to accommodate pump, which must run in direction of scroll.

FIG. 694. Sizes and Prices.

No.	1¾	2	3	4	6	8	10	12	15	18
IRON	Pant 40.00	Pare 60.00	Park 75.00	Part 110.00	Pass 170.00	Past 265.00	Pate 330.00	Path 420.00	Pave 600.00	Pawn 850.00
BRASS ...	Peak 90.00	Peal 110.00	Peat 150.00	Peck 240.00	Peek 360.00					

For table showing number of revolutions necessary to raise water to different heights, see page 197.

PORTABLE GARDEN FORCE PUMP.

FIG. 642.

Fig. 642 represents in practical operation our Portable Garden Force Pump, for washing windows and wagons, for use in conservatories, gardens, etc., and for forcing liquids upon trees and bushes blighted by insects, bugs or worms.

They are made of brass, which gives them a handsome appearance and renders them impervious to the actions of acids and liquors, and will not rust or corrode. With this Pump there is no suction hose, as the Pump sets directly in the water, thus always securing a perfect suction. With each Pump we furnish the extras given in the table below, although they could be changed to suit requirements of customers. Longer lengths of hose are charged extra.

Price.

FIG. 642, with 3 feet ½ inch discharge hose, brass discharge pipe and sprinkler, each, ... (Rang.) $9.00

See pages 232 and 233 for lists of hose, discharge pipes, etc.

PORTABLE AQUAJECT.

FIG. 560.

The above cut represents in practical operation a very useful and almost indispensable adjunct to every household, factory and warehouse in the world.

It is a very compact and effective Force Pump, so small, weighing only eight pounds, that it can be carried about anywhere without the least difficulty, and at the same time susceptible of the most important results. It is difficult to enumerate the many services this Pump will perform ; but for washing windows, wagons, sprinkling lawns, in conservatories, gardens, and for incipient fires, it has no equal.

With each Pump is sent suction and discharge hose connected, so that it requires no labor to put in immediate operation. Longer lengths of hose can be furnished if desired.

Price.

FIG. 560, with 2½ feet ¾ inch suction, and 3 feet ⅝ inch discharge Hose, brass discharge pipe and sprinkler, . . (Lay.) . . . $9.00

☞ All the parts liable to impair the usefulness of the Pump by rust or corrosion are made of brass.

THE HYDRONETTE.

FIG. 668.

The above cut represents in operation our new "Hydronette" or Portable Force Pump, for watering gardens, washing carriages or diffusing liquids of any kind upon trees or shrubs affected by insects, worms, etc. Its appearance and method of operation differs considerably from anything given before, but we can recommend it as being just as efficient and much more convenient for many places. It is made of brass, handsomely finished, and so light it may be carried under the arm or in the hand, as most convenient, when one must carry a pail.

It carries only suction hose, so no discharge hose demands attention at any time, but by turning the nozzle the water may be distributed in any direction.

Below we give price on these Pumps as they are sent to market.

Price.

FIG. 668, with 4 feet ⅝ in. suction hose, strainer and sprinkler, (Roam) $9.00

HAND ROTARY GARDEN ENGINE.

MOUNTED ON WOODEN BARROW.

FIG. 537.

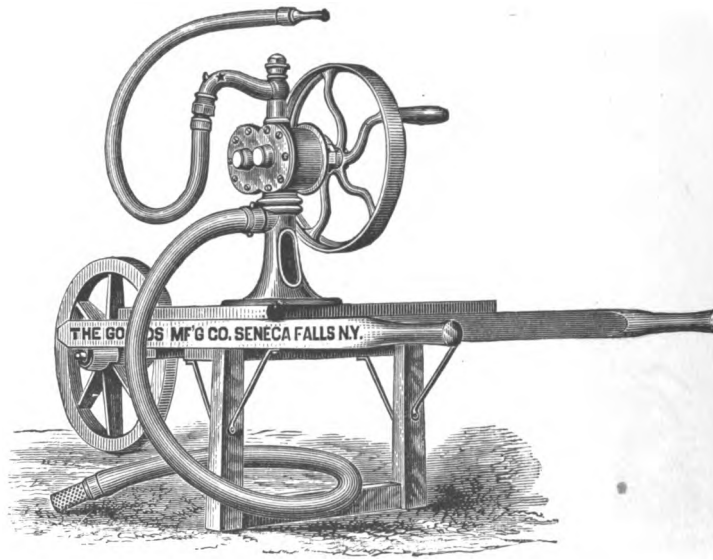


Fig. 537 represents our new Rotary Garden Engine, mounted on wooden barrow, that can be moved from place to place. These Rotary Pumps are identical with those previously described except the mode of attaching suction hose, which is much more convenient for this purpose, being in plain sight and unobstructed by other parts. The barrow is made from the best seasoned hard wood and strong enough for ordinary use. We believe where it is not necessary to carry water with the Pump that these engines have a large sphere of usefulness about the yard or lawn, or in buildings, as they are less cumbersome than the old box engines and more capacious. The bronze Pumps are well adapted to use about the floors of breweries or distilleries for transferring liquors from casks or tanks.

Below we give prices on Engine complete, as per cut, with 6 feet suction and 3 feet discharge hose, suction basket, hose couplings and nozzle. If engine and barrow only are wanted, without hose, couplings or strainer, we will furnish same at a proportionate reduction in price.

FIG. 537. Sizes, Prices, Etc.

No.	Suction.	Discharge.	Revolutions per Minute.	Gallons per Minute.	IRON.		BRONZE.	
					Cipher.	Price.	Cipher.	Price.
1	1¼ in.	1 in.	100	13	Kink	$29.50	Flask	$51.50
2	1¼ "	1 "	100	14	Kirk	32.50	Flat	56.50
3	1½ "	1¼ "	100	17	Kite	36.50	Flaw	61.50
4	1½ "	1¼ "	100	27	Kine	46.00	Flax	76.00
5	2 "	1½ "	100	36	King	52.00	Flay	87.00

	No. 1.	No. 2.	No. 3.	No. 4.	No. 5.
Pump, only side suction, Iron, ...	$20.00	$23.00	$27.00	$35.00	$40.00
" " " " Bronze, . . .	42.00	47.00	52.00	65.00	75.00

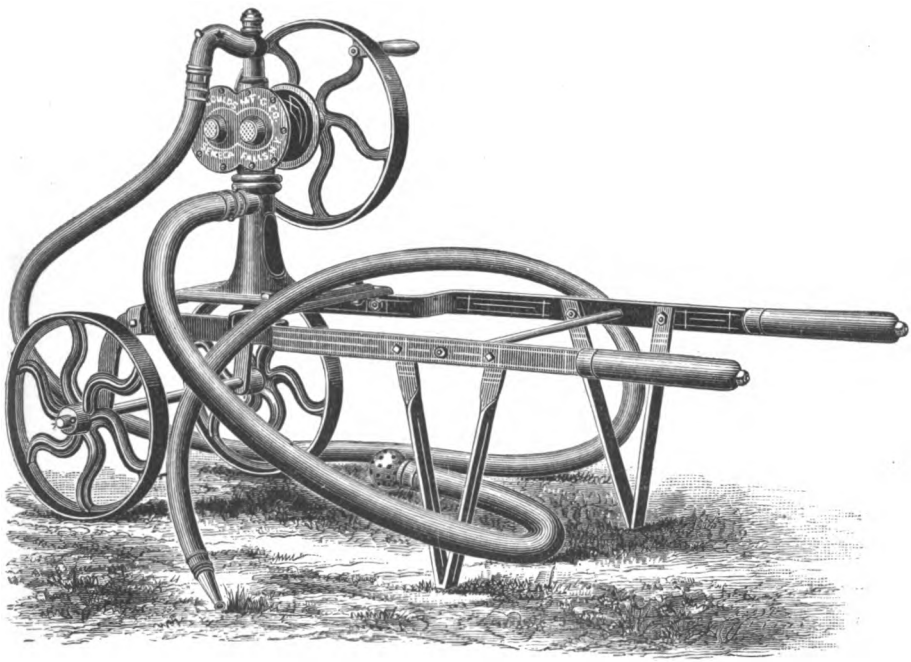
Longer lengths of hose furnished if desired.

See pages 232 and 233 for lists on hose, couplings, etc.

HAND ROTARY GARDEN ENGINE.

MOUNTED ON WROUGHT-IRON BARROW.

FIG. 710.



The above cut accurately represents our Hand Rotary Garden Engine, mounted on wrought-iron barrow with iron wheels.

This Engine is designed for the same purposes as our Fig. 537, more fully described on opposite page, except that the extra strength given it by the strongly bolted wrought-iron frame and iron wheels, running on turned axles, render it better adapted for the indiscriminate use of employees.

Its uses about the yard, lawn, or for protecting property are manifold; for, although of light appearance, the table below shows how great its capacity is, while it will force water from 75 to 100 feet horizontally. Below we give sizes and prices complete, as per cut, with six feet suction and three feet leading hose, suction basket, hose couplings and nozzle.

If Engine and barrow only are wanted, without hose couplings or nozzle, a proper reduction will be made.

FIG. 710. Sizes, Prices, Etc.

No.	Suction.	Discharge.	Rev. per Minute.	Gals. per Minute.	IRON.		BRONZE.	
					Cipher.	Price.	Cipher.	Price.
1	1¼ in.	1 in.	100	13	Scrip	$35.00	Seal	$57.00
2	1¼ "	1 "	100	14	Scrub	38.00	Seam	62.00
3	1½ "	1¼ "	100	17	Scud	45.00	Sear	70.00
4	1½ "	1¼ "	100	27	Scull	55.00	Seat	85.00
5	2 "	1½ "	100	36	Sea	60.00	Synod	95.00

Longer lengths of hose furnished, if desired. See pages 232 and 233 for lists on hose, hose couplings, etc., etc.

HAND GARDEN FORCE PUMP.

MOUNTED ON WOODEN BARROW.

FIG. 640.

The above cut represents one of our well-known Hand Force Pumps mounted on wooden barrow, that can be moved from place to place. This barrow is light, and the whole can be easily moved about the yard or garden for supplying water upon plants and trees or watering lawns, etc.

This Engine has no useless parts, and is cheap, simple and effective. The Pump itself can be readily taken from the barrow, and represents good value for the many uses of a hand force pump about the house or premises.

Below we give prices complete as per cut, with 6 feet 1¼ inch suction hose and 3 feet 1 inch discharge hose, hose couplings, discharge pipe, suction basket, etc.

FIG. 640. Sizes, Prices, Etc.

No.	Diameter Pump.	Suction.	Discharge.	Stroke.	Capacity per Stroke.	Cipher.	Price.
2	2½ in.	1¼ in.	1 in.	6 in.	⅛ gal.	Rain	$23.00
4	3 "	1¼ "	1 "	6 "	⅙ "	Raise	26.50

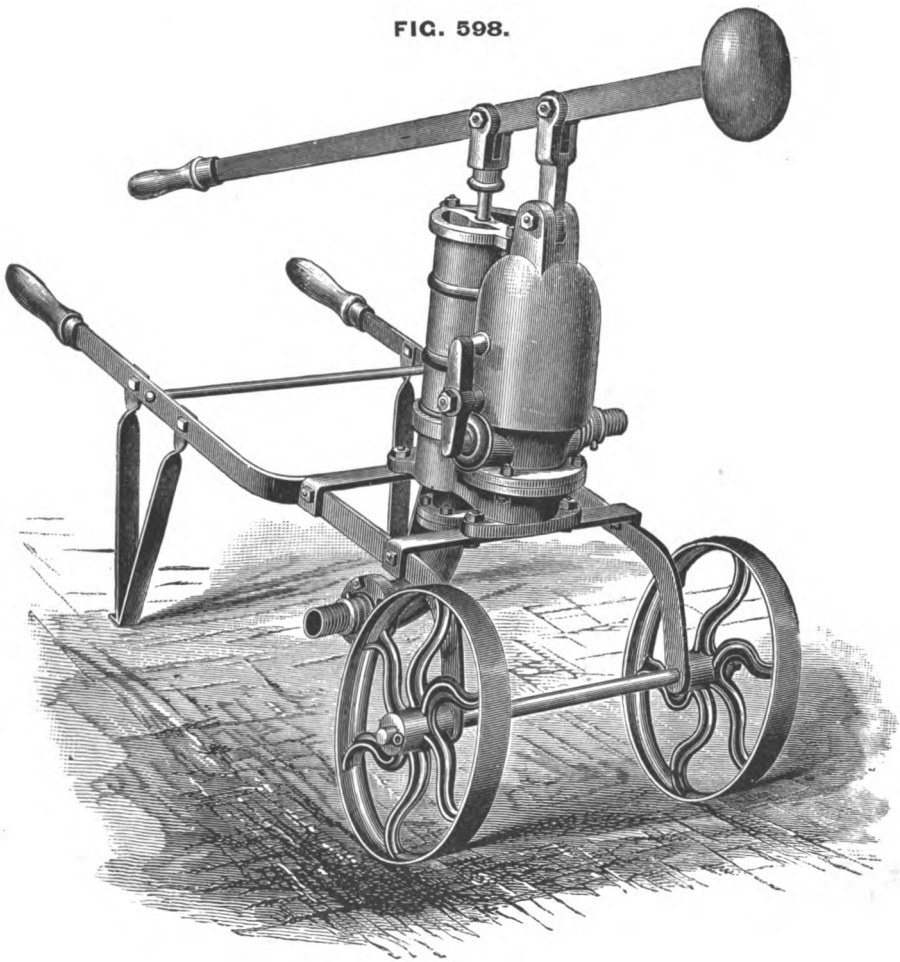
Longer lengths of hose furnished if desired.

See pages 232 and 233 for lists on hose, couplings, discharge pipes, etc.

SINGLE ACTING IRON FORCE PUMP.

BRASS-LINED CYLINDER, MOUNTED ON WROUGHT-IRON BARROW, TWO WHEELS.

FIG. 598.



The cut shows a portable Lift and Force Pump of great power and capacity, for watering lawns, gardens, etc., and extinguishing fires when necessary. The cylinder is of hard brass, 4¼ inches diameter, and cannot be bruised or injured, as a shell of cast iron surrounds it completely. The valves are made of rubber, and can be got at very easily by unscrewing the nut holding the clamp on side of air chamber and removing the door. With each engine belongs 6 feet 1½ inch spiral suction and 12 feet 1¼ inch discharge hose, with brass couplings for each size ; a suction basket, brass hose nozzle and spreader, and wrenches for nuts and hose.

FIG. 598. Sizes, Prices, Etc.

Diameter Cylinder.	Suction.	Discharge.	Stroke.	Capacity per Stroke.	Weight.	Cipher.	Price.
4¼ in.	1½ in.	1¼ in.	8 in.	½ gal.	200 lbs.	Mist.	$43.00

Longer lengths of hose furnished if desired, at extra price. See pages 232 and 233 for lists on hose, couplings, etc.

DOUBLE ACTING IRON FORCE PUMP.

BRASS-LINED CYLINDER, MOUNTED ON WROUGHT-IRON BARROW. TWO WHEELS.

FIG. 630.

The cut shows a portable Double Acting Lift and Force Pump; constructed with passages very large and direct, and with a view to great compactness and capacity. The cylinder is of hard brass, 5 inches diameter, surrounded by a wall of cast iron as a protection against bruising. Four to six men can operate the engine at one time, so that it is easily available for domestic purposes, or for extinguishing fires, etc. It will throw a fine stream through a half-inch nozzle from 80 to 100 feet, and be found to be very effective for any purpose required of such a machine.

In cities or villages with narrow streets, the ease with which this Engine and the one on opposite page can be manipulated, will very highly commend them.

One bolt and nut holds in place a door at either end of bed plate, which can be opened to get at the rubber ball valves.

Below we give price of Engine complete as per cut, with 6 feet 2 inches spiral suction hose and 12 feet 1½ inches discharge hose, brass hose pipe and spreader, hose couplings, suction basket, etc.

FIG. 630. Sizes, Prices, Etc.

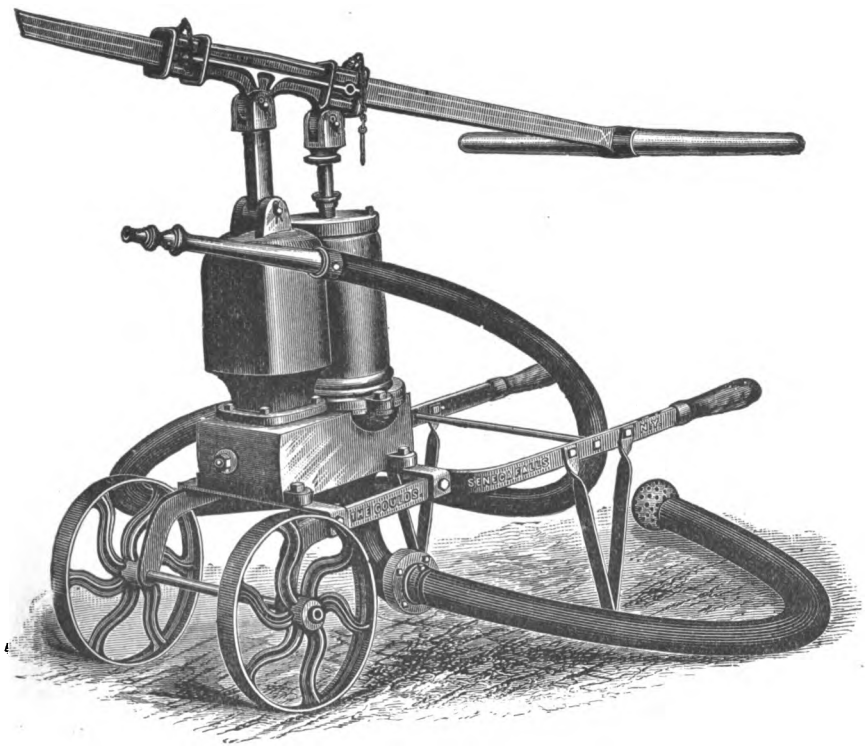
Diameter Cylinder.	Suction.	Discharge.	Stroke.	Capacity per Revolution.	Weight.	Cipher.	Price.
5 in.	2 in.	1½ in.	8 in.	1⅓ gal.	300 lbs.	Race.	$58.00

Longer lengths of hose can be furnished, if desired, at extra price. See pages 232 and 233 for lists on hose, couplings, etc.

DOUBLE ACTING IRON FORCE PUMP.

WITH BRASS-LINED CYLINDER, MOUNTED ON WROUGHT-IRON BARROW, AND WITH WROUGHT-IRON EXTENSION LEVERS.

FIG. 653.



This is the same Engine as described on previous page, except that the one above is provided with wrought-iron adjustable arms with wood brakes, on which six to eight men can work, and is consequently capable of performing greater service.

For special description see Fig. 630 on opposite page.

Below we give price of Engine complete as per cut, with 6 feet 2 inch spiral suction hose and 12 feet 1½ inch discharge hose, brass hose pipe and spreader, hose couplings, suction basket, etc.

FIG. 653. Sizes, Prices, Etc.

Diameter Cylinder.	Suction.	Discharge.	Stroke.	Capacity per Revolution.	Weight.	Cipher.	Price.
5 in.	2 in.	1½ in.	8 in.	1⅓ gal.	338 lbs.	Ravel.	$64.00

Longer lengths of hose furnished if desired, at extra price.

See pages 232 and 233 for lists on hose, hose couplings, etc.

GARDEN OR FIRE ENGINE.

FIG. 304.

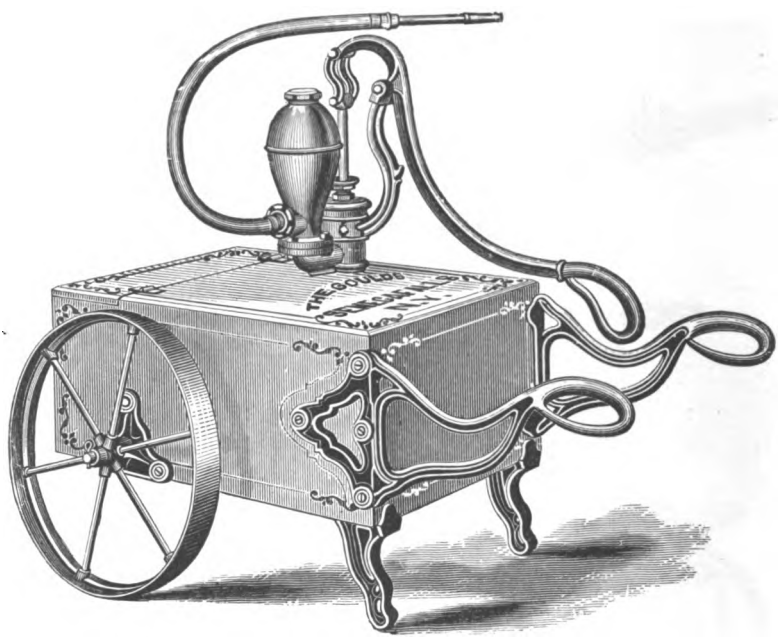


Fig. 304 represents our Garden Engine, with either wood or iron handles, as ordered, which for capacity, utility and convenience, is unsurpassed.

The Pump is placed inside a box of dimensions suitably large to hold about a barrel of water, and being on wheels is easily moved to any place where it is desirable to use it.

Fruit growers and nurserymen will thoroughly appreciate this apparatus, which enables them in seasons of drought to pour down the refreshing water on the parched trees, and endow them with fresh vitality. In incipient fires, also, this would be efficacious.

Below we give prices on this Engine complete as per cut, with 3 feet 1 inch discharge hose and discharge pipe.

FIG. 304. Sizes, Prices, Etc.

	Diameter Pump.	Suction.	Discharge.	Stroke.	Capacity per Stroke.	Cipher.	Price.
With iron handles, . .	3 in.	1½ in.	1 in.	6 in.	⅙ gal.	Drive	$26.00
With wood handles, . .	3 "	1½ "	1 "	6 "	⅙ "	Droll	25.00

We can also line these boxes with lead at an extra net charge of $5.00, and with galvanized iron at an extra net charge of $3.00, when they will be unaffected by swelling and shrinking of the wood.

GARDEN OR FIRE ENGINE, SIDE SUCTION.

FIG. 309.

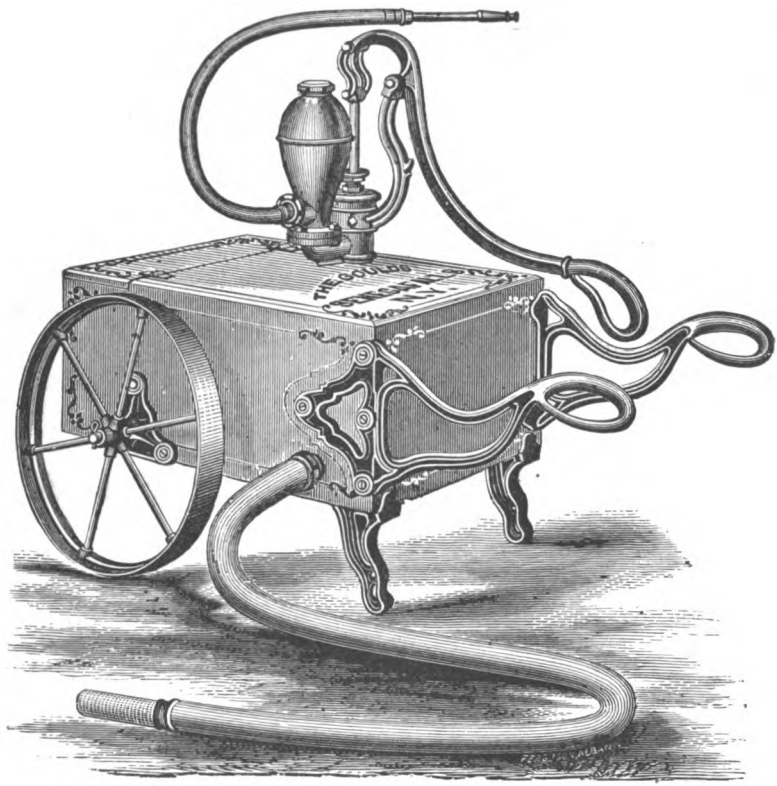


Fig. 309 is very similar to Fig. 304, except that it has an opening in the side of the box into which is inserted an attachment with threads cut, on to which can be fastened suction hose. The engine can then be moved to any point where water is found and operated as long as the water lasts.

Below we give price of engine, with 3 feet 1 inch discharge hose and brass discharge pipe. No suction hose is included in prices, but it is fitted for 1 ½ inch hard suction hose, which we can furnish at lowest market rates.

FIG. 309. Sizes, Prices, Etc.

	Diameter Pump.	Suction.	Dis.	Stroke.	Capacity per Stroke.	Cipher.	Price.
With Iron Handles,	3 in.	1 ½ in.	1 in.	6 in.	⅙ gal.	Drown	$29.00
With Wood Handles,	3 "	1 ½ "	1 "	6 "	⅙ "	Drug	28.00

We can also line these boxes with lead at an extra net charge of $5.00, and with galvanized iron at an extra net charge of $3.00, when they will be unaffected by swelling and shrinking of the wood.

PROTECTION HAND FIRE ENGINE.

FIG. 456.

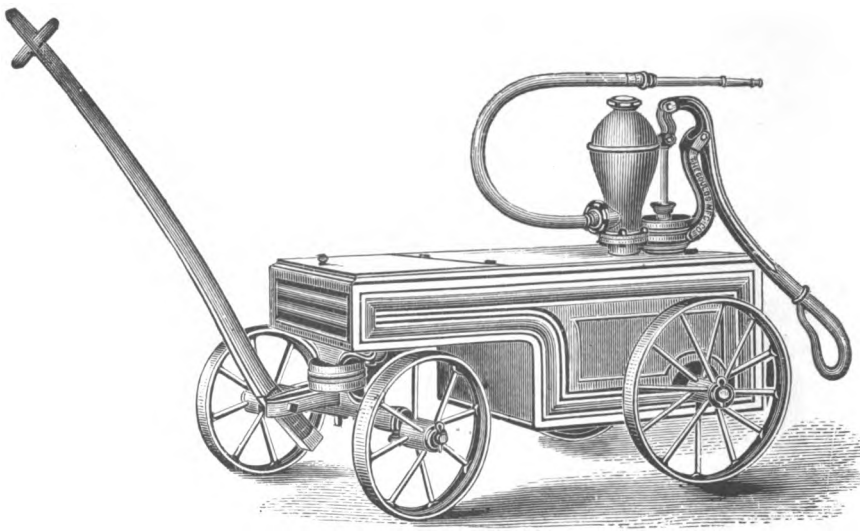


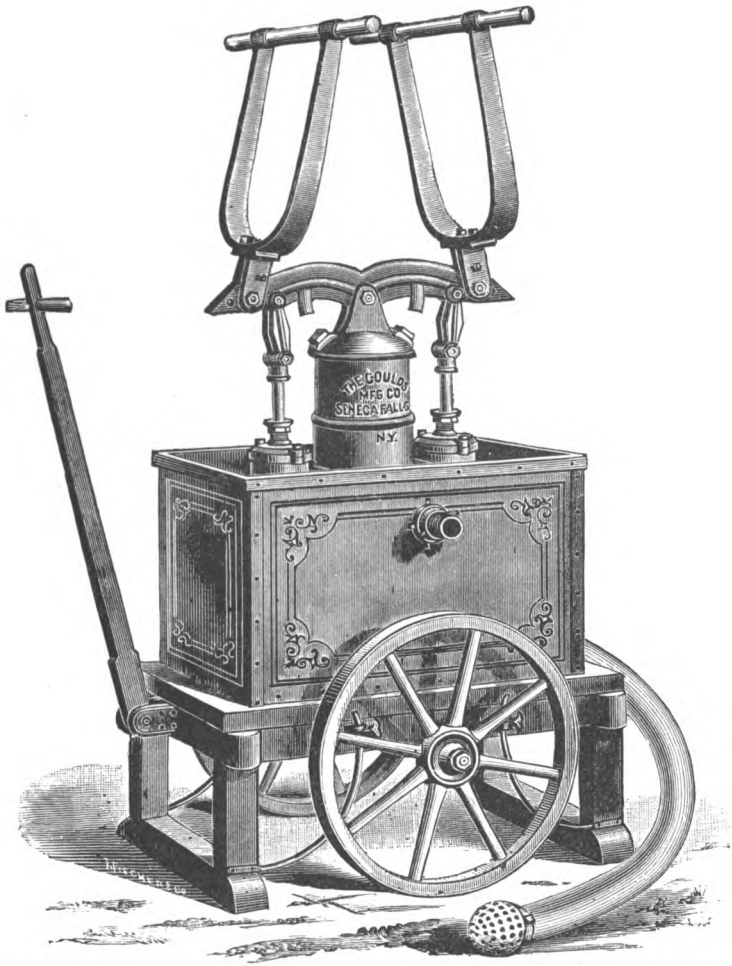
Fig. 456 illustrates a small Fire Engine with a water reservoir of a capacity of, say, two barrels, mounted on wheels. One person can easily transport it from place to place, and operate it when necessary for a variety of purposes. Water can be thrown from 75 to 90 feet horizontally, and can be taken either from the box, or by attaching suction hose to the coupling at the end of the box, be drafted from wells or cisters 15 to 25 feet deep. We build this Pump of iron, or with brass lined cylinder and brass piston, and can also line the box with heavy sheet lead, as per table given below. Two wrenches accompany each machine, as well as 5 feet 1 inch hose and suitable hose pipe.

FIG. 456. Sizes, Prices, Etc.

	Diameter Pump.	Stroke.	Capacity per Stroke.	Cipher.	Price.
Engine, with iron pump, ...	4 in.	8 in.	½ gal.	Gill	$80.00
Engine, with iron Pump with brass lined cylinder and brass plunger, ...	4 "	8 "	½ "	Gilt	92.00
Engine, with iron Pump with brass lined cylinder and brass plunger. Box lined with heavy sheet lead, ...	4 "	8 "	½ "	Gim	102.00

"UNION" HAND FIRE ENGINE.

FIG. 766.



This shows our "Union" Hand Fire Engine, especially constructed to meet the needs of small villages or towns, or around warehouses, country seats, etc.

The tank is made of the best galvanized wrought iron, and sets on a very heavy and strongly bolted wood frame. It can be operated by from two to six men, and will draw from the tank or through suction hose from any other supply. The knees are so constructed that they will fold up while being moved, and when in place hold the engine firmly on the ground when in operation.

Below we give price on Engine complete. No suction or discharge hose is included in these prices, but we can furnish same at lowest market rates.

FIG. 766. Sizes, Prices, Etc.

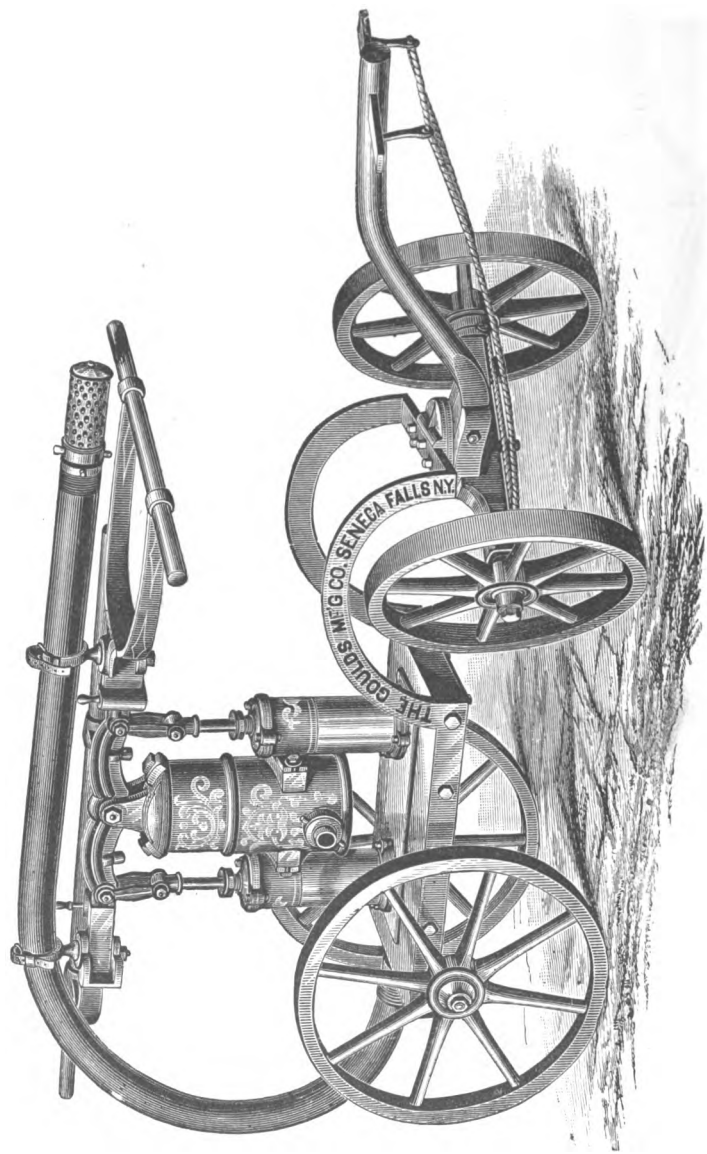
No.	Diameter Cylinders.	Suction.	Discharge.	Capacity per Revolution.	IRON CYLINDERS.		BRASS CYLINDERS.	
					Cipher.	Price.	Cipher.	Price.
6	3½ in.	2½ in.	1¼ in.	½ gal.	Vivify	$ 90.00	Vixenly	$100.00
8	4 "	2½ "	1½ "	⅔ "	Vixane	100.00	Vixind	120.00
10	4½ "	3 "	2 "	⅞ "	Vixen	120.00	Vizard	145.00

See pages 232 and 233 for lists on hose, couplings, discharge pipes, etc.

SWAN NECK VILLAGE FIRE ENGINE.

WITH GUN-METAL CYLINDERS.

FIG. 465.



For description and prices see next page.

SWAN NECK VILLAGE FIRE ENGINE.

FIG. 465.

The cut on the opposite page will readily commend itself to all villages and towns where a good Engine is required at a moderate expense—and where it is desired to have something in which is embodied all the elements of a first-class Engine, so far as the Pump is concerned, without any useless outlay upon a reservoir or box.

These Engines are as well built as those much more expensive, being well ironed and made with strong wooden wheels with wrought-iron tires, hard wood pole and brakes, fifth wheel, reversible and folding brakes, etc., etc. The cylinders are of gun metal, the valves of approved patterns, and everything as complete as first-class workmanship and the best of material can make them.

From eight to twelve men can work on them, and with this power a nice stream of water can be forced on to buildings of ordinary size.

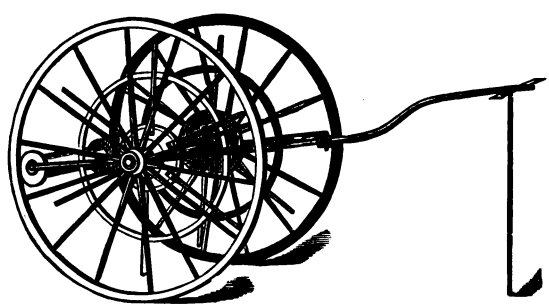
FIG. 465. Sizes, Prices, Etc.

No.	Diameter Cylinders.	Suction.	Discharge.	Stroke.	Capacity per Revolution.	GUN METAL CYLINDERS.	
						Cipher.	Price.
10.	4½ in.	2½ in.	1½ in.	6 in.	⅞ gal.	Glaze	$200.00
16	6 "	3 "	2 "	8 "	2 "	Gleam	280.00

The above prices do not include any hose. For list on hose, couplings, etc., see pages 232 and 233.

BALANCED HOSE CART AND REEL.

FIG. 544.



The above cut is a representation of a Balanced Hose Cart, with wheels 36 inches in diameter, all wrought-iron frame, and hose reel of sufficient capacity to carry 300 feet 1½ inch or 200 feet 2 inch hose. They are very handsomely gotten up. We make other sizes and styles of Hose Carts also, and would solicit correspondence concerning them.

Price.

FIG. 544, ... (Lake.) $80.00

NEW SWAN NECK VILLAGE FIRE ENGINE.

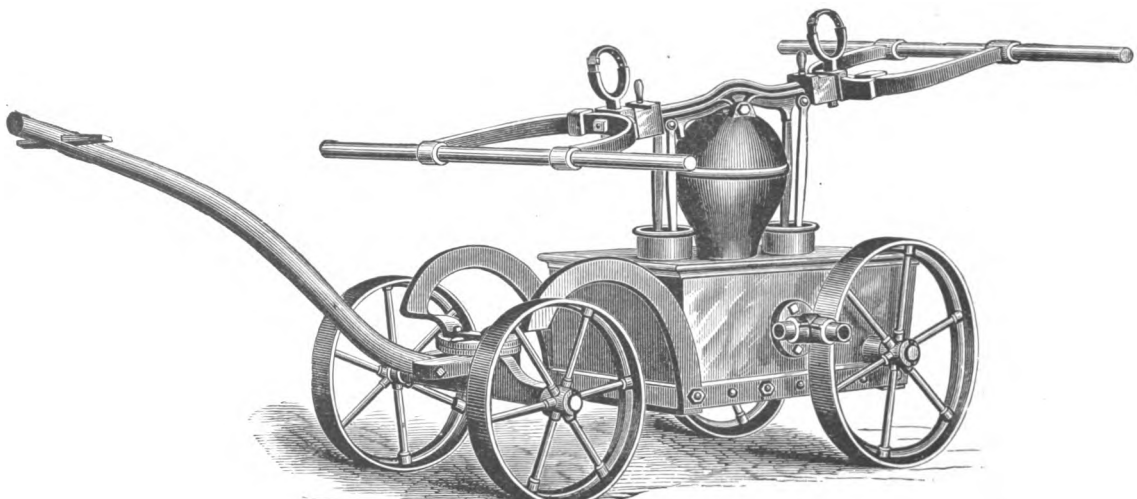


FIG. 549.

Fig. 549 represents a strong, durable and very capacious Fire Engine, which we have made particularly for such localities where the streets are very narrow and require elements of compactness in order to be available. The cylinders, valves and valve seats are of gun metal, the whole constructed of the very best material and in the most substantial manner. The reservoir or tank is made of galvanized iron, 3 feet long, 2 feet wide and 16 inches deep. The brakes fold in such a manner that when folded they are in a position lengthwise of the machine and from 15 to 20 men can work on them. We can arrange these Engines for either one or two streams as ordered; also, when desired, so that the suction can be taken from the reservoir as well as at the end of the Engine.

FIG. 549. Sizes, Prices, Etc.

Diameter Cylinders.	Suction.	Discharge.	Stroke.	Capacity per Revolution.	Cipher.	Price.
6 in.	3 in.	2 in.	7 in.	1¾ gal.	Mail	$300.00

See pages 232 to 233 for lists on hose, hose couplings, discharge pipes, etc., etc.

WAREHOUSE OR PLANTATION FIRE ENGINE.

WITH FOLDING BRAKES—FITTED FOR ATTACHING SUCTION HOSE.
ROOM ON THE BRAKES FOR TEN MEN.

FIG. 539.

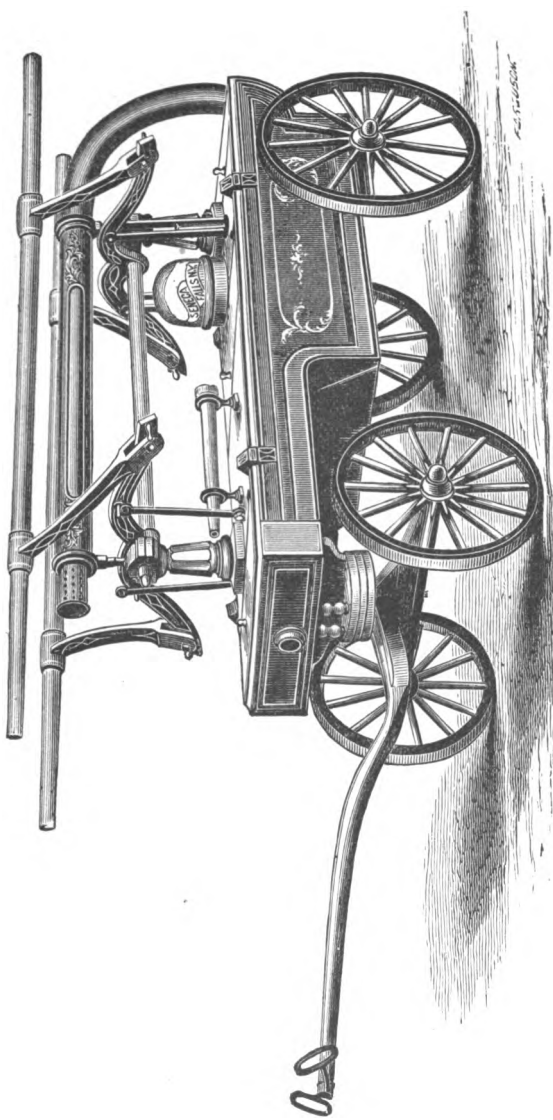


Fig. 539 represents our Warehouse or Plantation Fire Engine, constructed especially for use in tropical climates, with brass cylinders, 4½ inches calibre by 7 inches stroke, brass pistons, valve seats; folding brakes of wrought iron, wheels of best seasoned hickory wood (iron bound), patent iron hubs, and patent wrought-iron axles; the whole constructed in a thoroughly reliable manner, to meet such emergencies as usually arise at times of fire, viz.: the encountering of rough obstacles, running through narrow and roughly paved streets, etc. We furnish without extra charge 25 feet discharge hose and brass discharge pipe. Fitted for attaching suction, which we furnish when ordered. This Engine will throw a ½ or ⅝ stream about 100 feet.

Size and Price.

FIG. 539, Plantation Fire Engine, suitable for discharge hose of 1½ inch calibre, and suction hose of 2 inch calibre, each, net, ... (Lade.) $325.00

No. 1, PIANO STYLE FIRE ENGINE. WITH DOUBLE BRAKES.

FURNISHED WITH SUCTION HOSE. ROOM ON THE BRAKES FOR TWENTY MEN.

FIG. 540.

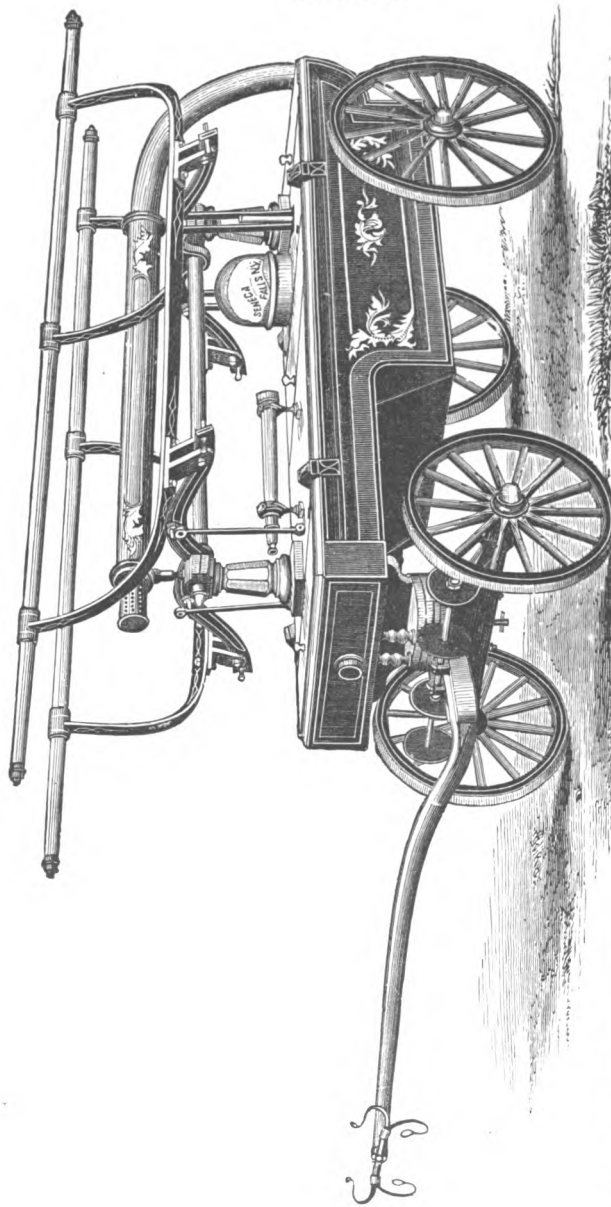
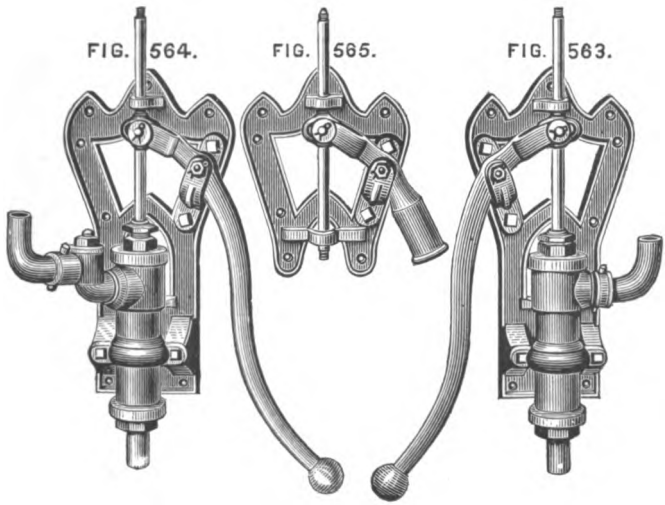


FIG. 540 represents our Piano Style of Fire Engine for small towns and villages, constructed with brass cylinders 6½ inches calibre, by 7 inches stroke. Folding brakes of wrought iron, 16 feet long, wheels of best seasoned timber (iron bound), 31 and 37 inches in diameter, and a rope reel. The valves and valve seats are of gun metal, and consequently are not affected by the dryness or dampness of the atmosphere, as is the case with leather valves used in the ordinary engine, which, when called upon for fire service, especially in hot countries, are found to be so hard and dried up that the machine is rendered entirely ineffective for the occasion. It is furnished with 12 feet of suction hose, carried squirrel-tail fashion, a brass strainer, brass discharge pipes, extra nozzles and the requisite wrenches, etc., complete for use. This engine will throw a ¾ or ⅞-inch stream of water about 140 feet. Weight, 1,800 pounds. The 7-inch size throws two streams.

FIG. 540, 6½ inch brass cylinders, 1 stream, suitable for 2 inch discharge hose and 3½ inch suction hose, each, net, . (Lady.) . . $650.00
" " 7 " " " " 2 " " " 3½ " " " " . (Lag.) . . 725.00
" " " " 2 streams, " " " " " " " "

"CROTON" BRASS LIFT AND FORCE PUMPS.

ON IRON FRAME, RIGHT OR LEFT HANDED.



The above cuts represent our Figs. 563, 564 and 565 Pumps and frame for forcing and lifting small quantities of water to considerable elevations.

The *modus operandi* of these Pumps is as follows: Locate either Fig. 563 or 564 in the first story of the building, within suction distance of the water, and connect your suction pipe. From the end of elbow extend your leading pipe up through the upper stories as far as water is required, having outlet cocks as well as a Fig. 565 in each story. Continue the connecting rod from Pump in first story to the Fig. 565 in next story, and from that to the next one, and so on up through the several stories. It will be seen that water can be had in any story from one and the same pump, at small expense. The Pump being hung on a swivel it can be turned to any angle.

In cities, where the head from water works will not force the water above the first story, these Pumps will be fully appreciated. The top end of guide rods on Figs. 563 and 564, and the bottom end on Fig. 565, are cut for ¼ inch gas pipe.

We also make a Force Pump with air chamber, as illustrated on the following page, which can be used in any place as well as these, and will force water through hose and discharge pipe.

Sizes, Prices, Etc.

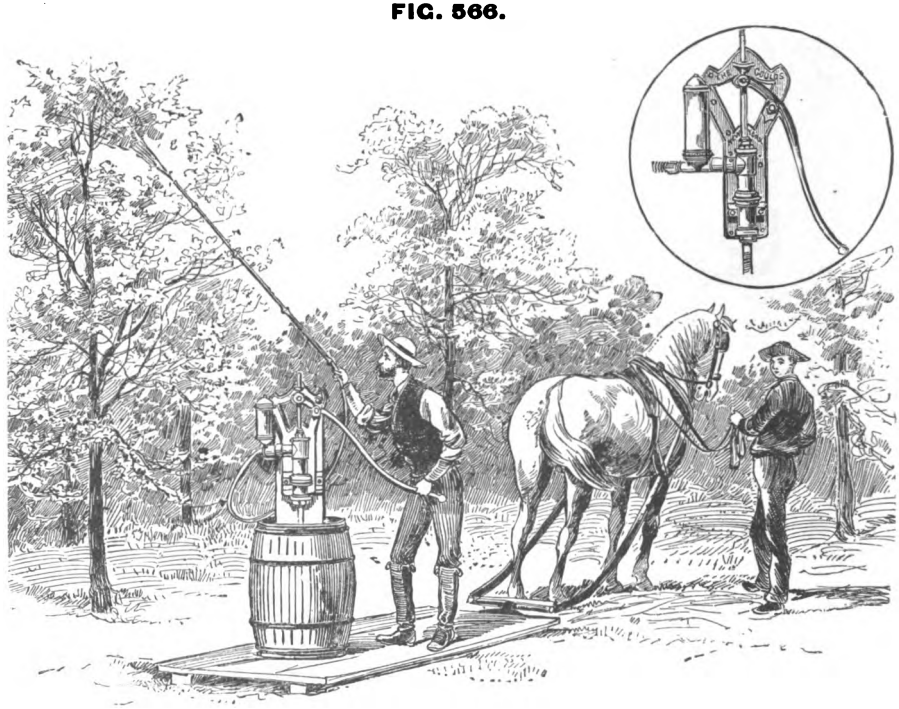
Figure.	Dia. Cylinder.	Suction for Lead Pipe.	Discharge for Lead Pipe.	Cipher.	Price.
563	2 inches.	1 inch.	¾ inches.	Leak	$12.00
564	2 "	1 "	¾ "	Lean	15.00
565	Extra frame, ...			Leap	5.00

We can fit both suction and discharge for either hose or wrought-iron pipe, if so ordered.

"PACIFIC" PORTABLE FORCE PUMP.

ON IRON FRAME, RIGHT OR LEFT HANDED.

FIG. 566.



This cut shows in faithful operation one of our "Croton" Force Pumps, with air chamber, as they may be utilized for destroying bugs, worms or insects upon plants or flowering shrubs, trees, etc. They are made of cast brass, excepting frame and lever, and are heavy and strong, and capable of doing more and better work than the cheaper varieties of Portable Garden Pumps. The metal is unaffected by wine, acids or chemical preparations, and will not rust or corrode.

They may also be used as a small House Force Pump in many places that would not admit a larger or more cumbersome Pump, and their neat appearance would recommend them to any room or place. In this connection, they are admirably adapted for railroad cars, steamboats, yachts, etc.

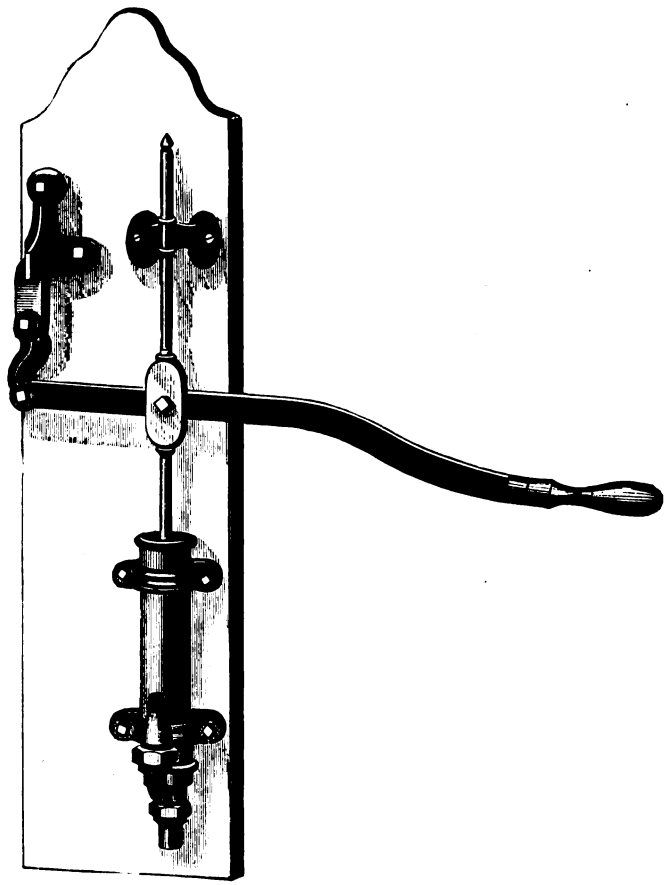
FIG. 566. Sizes, Prices, Etc.

Diameter Cylinder.	Suction for Lead Pipe.	Discharge for Hose.	Cipher.	Price.
2 in.	1 in.	¾ in.	Led	$16.00

We can fit both suction and discharge for hose or gas pipe, if so ordered.

BRASS AIR PUMP.

FIG. 459.



The cut represents a Brass Air Pump of proper construction for forcing air or any other gas into barrels, casks and other vessels. The uses of an Air Pump are so various that we prefer to know for what it is to be employed, quantity of air desired, etc., as we do not claim this Pump is adapted to all cases.

Sizes and Prices.

FIG. 459, 2 inch bore, 6 inch stroke, ... (Girl.) $15.00

We make also an Air Pump intended for heavier pressures, say 150 to 200 pounds to the square inch, as below.

FIG. 459, 1½ inch bore, 10 inch stroke, ... (Gird.) $30.00

AIR PRESSURE OR VACUUM PUMPS.

FIG. 605.

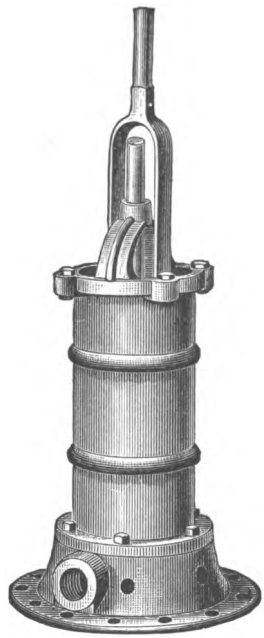


FIG. 623.

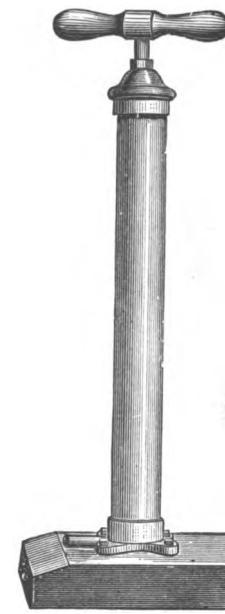


Fig. 605 represents an Air Pressure or Vacuum Pump for exhausting air or condensing it to almost any desired pressure. It is constructed with brass-lined cylinder and metallic valves, in a scientific manner, so that all the air received into the cylinder on the up stroke of the piston will be forced out on the down stroke. The cylinder is of 6 inches bore and 12 inches stroke, will take in 319 cubic inches of air at each stroke, and discharge it into a receiver at any desired pressure up to, say, 100 lbs. per square inch, by applying the necessary power.

The size of receiver that it will fill will be governed by the pressure. That is, at 50 revolutions the Pump will deliver 15,950 cubic inches, or about 9 cubic feet at ordinary atmospheric pressure.

At 2 atmospheres, or	15	lbs. pressure, about		4½	cubic feet.
At 3 "	30	"		3	"
At 4 "	45	"		2¼	"

This law governs all Air Pressure Pumps. In making high pressure the cylinder should be set in a box of water deeper than the top, so that at each stroke the water can follow the piston down into the cylinder to keep it cool and tight.

Fig. 623 represents an Air Exhausting Pump made of Brass throughout. It is perfect in its operations, and will answer for any purpose where it is not required to exhaust too much air in a given time. The valves are very perfect in their workings, and the whole Pump devised on scientific principles.

Sizes and Prices.

FIG. 605,	6 in. dia.,	12 in. stroke,	1¼ in. inlet and outlet . .	(Moor.) .	$25.00
FIG. 623,	2 "	18 "	. . . . .	(Quoit.) .	13.00

AIR PRESSURE OR VACUUM PUMP.

WITH BRAKE TOP FOR HAND POWER.

FIG. 772.

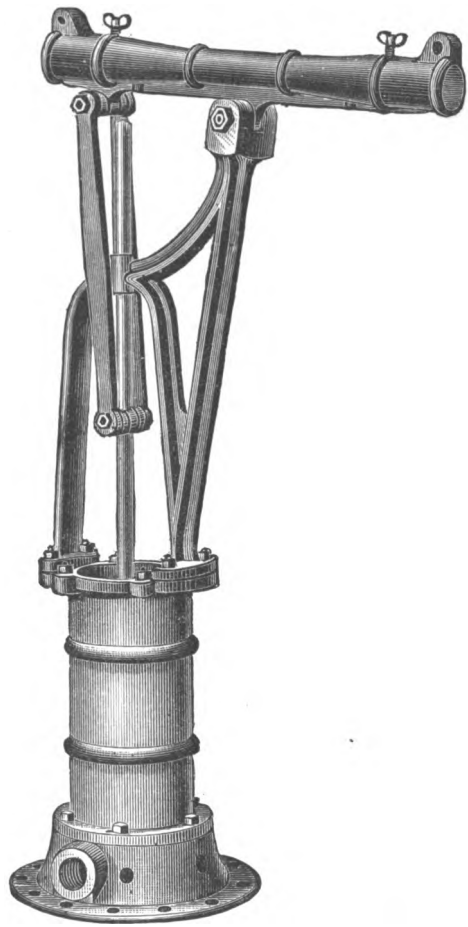


Fig. 772 represents our Air Pressure Pump, arranged with brake top for hand power where no other is available. We can also put on a proper shape forked rod which will adapt this Pump for power as well, thus making it equal to any emergency or circumstances. It is constructed with brass-lined cylinder and metallic valves in a scientific manner, so that all the air received into the cylinder on the up-stroke of the piston will be forced out on the down-stroke. The cylinder is of 6 inches bore and 12 inches stroke, will take in 319 cubic inches of air at each stroke, and discharge it into a receiver at any desired pressure up to, say, 100 pounds per square inch, by applying the necessary power. The size of receiver that it will fill will be governed by the pressure. We would refer to opposite page for tables relative to pressure and air delivered to receiver.

FIG. 772. Sizes, Prices, Etc.

No.	Dia. Cylinder.	Stroke.	Inlet.	Outlet.	Cipher.	Price.
16	6 inches.	12 inches.	1¼ inches.	1¼ inches.	Viary	$50.00

PLUMBERS' FORCE PUMP.

FIG. 322.

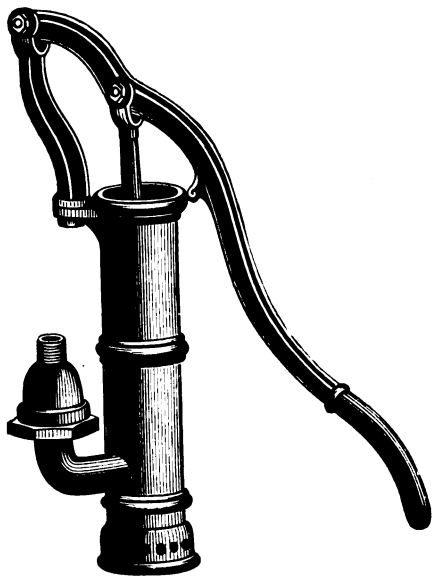
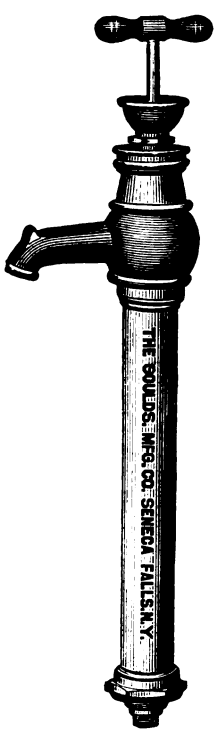


Fig. 322 represents an entirely new model of Plumbers' Force Pump, for removing obstructions in waste or water pipes. The working parts are made of brass. The pipe to be cleared is connected to the Pump by hose, while the Pump is placed in a vessel of water. The discharge is always fitted for ¾ inch hose coupling.

Size, Price, Etc.

FIG. 322, 2 inch cylinder, 5 inch stroke, . . (Dusty.) . $14.00

FIG. 323.



GAS COMPANIES' AND PLUMBERS' DRIP PUMP.

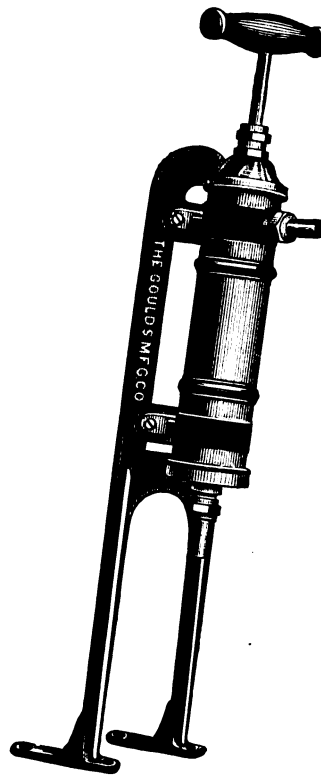
Fig. 323 shows a Brass Cylinder Suction Pump for extracting the water from Gas Drips. It is substantially built and answers the purpose admirably. Fitted for attaching ¾ or 1 inch iron pipe, as ordered, though always fitted for ¾ inch pipe, unless otherwise stipulated.

Size, Price, Etc.

FIG. 323, 2 in. bore, 12 in. stroke, . . (Dutch.) . . $12.00

BRASS ALE OR BEER PUMP.

FIG. 320.



The cut shows our new and improved Brass Ale or Beer Pump, made with solid brass piston rod, not tube, as some manufacturers use, handsomely finished and polished, and fitted with first-class valves.

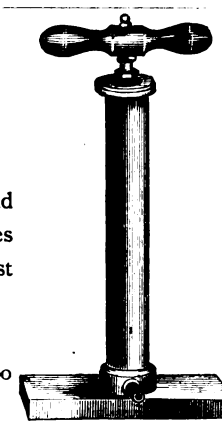
Size and Price.

FIG. 320, 2¼ inch bore, 8 inch stroke, ... (Dusky.) $7.00

We furnish these pumps with or without the stands, as ordered.

PNEUMATIC TEST PUMP.

FIG. 461.



The cut shows a Pump used by plumbers, gas and steam fitters very widely for ascertaining whether pipes leak or not. Can furnish gauge if wanted, at lowest market rates.

Size and Price.

FIG. 461, 2 in bore, 10 in. stroke, . . (Girt.) . . $12.00

A BRIEF DESCRIPTION OF THE HYDRAULIC RAM.

The cut on opposite page represents one of our Improved Hydraulic Rams, put up in operation, furnishing water for house, cattle, etc. The fountain is shown at the right. From thence the water is taken through the DRIVE PIPE, to the RAM, located in any convenient position, not less than 25 to 50 feet from the fountain. This is necessary, as about this length of pipe is required to secure the velocity of water requisite to work the RAM properly. In cases where it is not practicable, the pipe may be bent in a coil five or six feet in diameter. From the Ram the water is forced upwards through the discharge pipe, as shown, to the point of discharge. The Ram and pipe should be carefully secured against the effects of the frost.

The simple and effective operation of this machine, and its great durability withal, render it the most useful and valuable apparatus yet developed in the department of hydraulics for elevating water and conveying it to almost any desired distance, depending, however, on the amount of fall at disposal.

It is practicable where the spring or brook is only 18 inches higher than the Ram; yet, as the height increases, the more powerful the Ram operates, and its ability to force water to a greater elevation and distance correspondingly strengthened. The relative height of the spring or source of supply above the Ram, and the elevation to which it is required to raise, determine the relative proportion between the water raised and wasted—the quantity raised varying according to the height it is conveyed with a given fall; also, the distance the water has to be conducted, and consequent length of pipes, have some influence on the quantity delivered at the point of discharge, as the more extended the pipes through which the water has to be forced by the Ram, the more friction there is to be overcome by additional efforts on the part of the machine; notwithstanding, Rams are frequently and successfully employed for driving water a distance of 100 to 200 rods, to an altitude of 100 to 200 feet above the Ram, and severer trials than these even testify to the indispensability of this almost automatic device. A fall of 10 feet from the brook or spring to the Ram is abundantly sufficient to raise water to any point less than 150 feet above the location of the machine, while the same amount of fall would also raise water to a point considerably higher, though the supply of water will be proportionately diminished as the height and distance increase. When the requisite quantity of water is forthcoming from the Ram, operating under a certain fall, it is not judicious to give it more, for by so doing the strain on the machine is measurably augmented, those parts doing the labor are overtaxed, and the durability of the apparatus impaired and lessened.

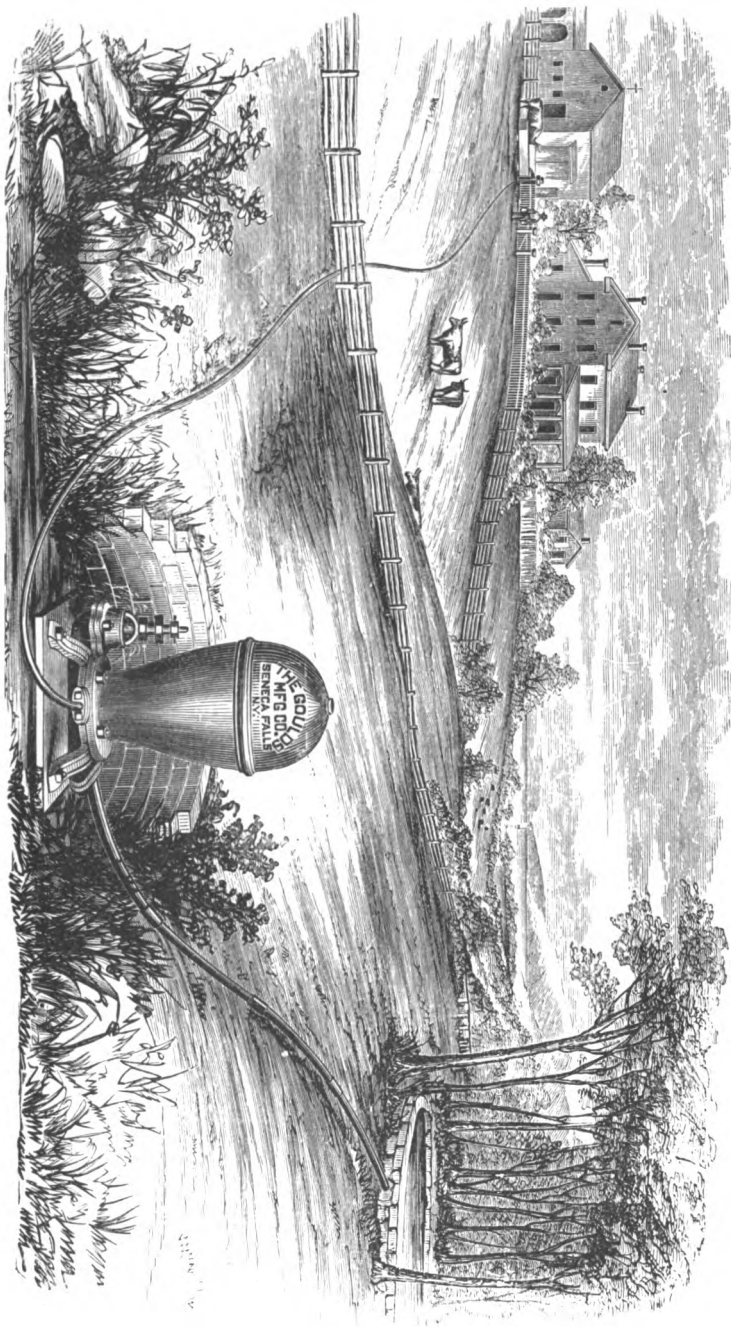
For ordinary purposes it is sufficient to say that, in conveying water, say 50 or 60 rods, it may be safely calculated that *one-seventh* of the water can be raised and discharged at an elevation *five times* as high as the fall, or *one-fourteenth* part can be raised and discharged, say *ten times* as high as the fall applied, and so in like proportion as the fall or height is varied.

Thus, with a fall of five feet, of every seven gallons drawn from the fountain, one may be raised twenty-five feet, or half a gallon fifty feet. Or with ten feet fall, one gallon of every fourteen may be raised to the height of 100 feet, and so in proportion as the fall or height is varied.

Turns in either drive or discharge pipe should be avoided if possible. When it is impossible to set the Ram without having elbows in the pipes, make the elbows as large as may be, so as to place as little obstruction to the free and easy flow of the water as is practicable.

These machines are made of iron and bronze. The valve stem and case are made of the latter material, which has more durable and lasting qualities than any other composition.

For very heavy pressures we make our large sizes of Rams extra heavy—using heavy brass ball valves, etc., etc., prices of which will be furnished upon application.

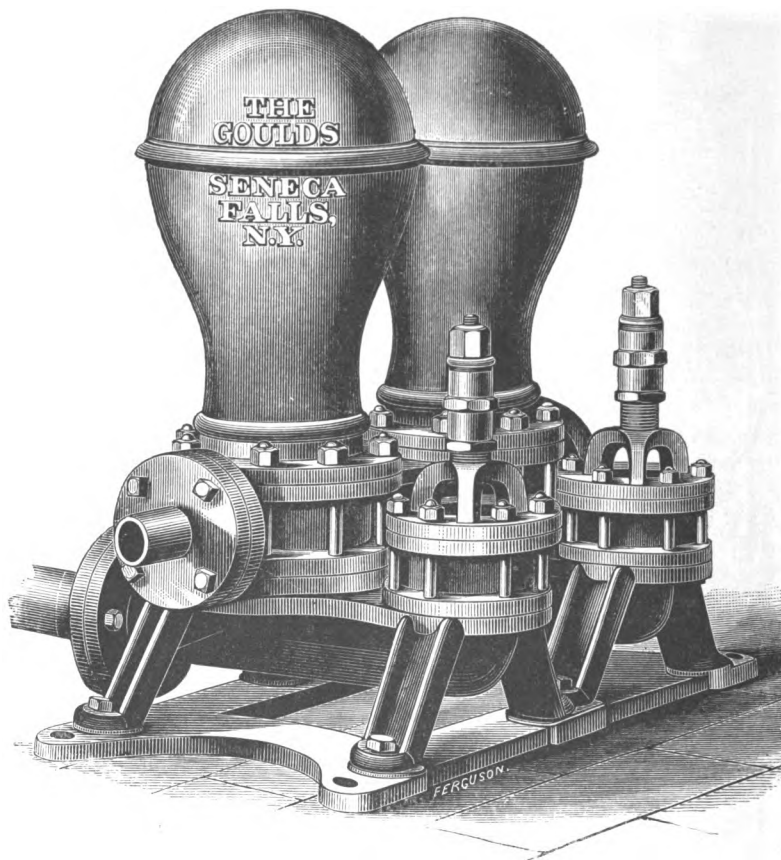


HYDRAULIC RAM IN OPERATION.

IMPROVED DOUBLE HYDRAULIC RAM.

FOR THE SUPPLY OF DWELLINGS, FACTORIES, VILLAGES, RAILROAD STATIONS, STOCK YARDS, ETC., WITH RUNNING WATER.

FIG. 346.



For description and prices see opposite page.

DESCRIPTION OF DOUBLE HYDRAULIC RAM.

FIG. 346.

This useful self-acting apparatus, which works day and night without needing attention, will raise water to any height or distance, without cost of labor or motive power, where a few feet fall can be obtained, and is suited for supplying public or private establishments, farm buildings, railway stations, etc., etc. The Hydraulic Ram was invented by Mortgolfier, but since his time many improvements have been made in the details of its construction, and as they have become better known and the slight expense for the first outlay and maintenance considered, they have grown more in favor and are now extensively used.

Recent practice has demonstrated the feasibility of employing Rams under circumstances which were within a short period regarded impracticable, but which fact testifies to the improvement of construction alluded to above. A fall of ten feet from source to Ram has been hitherto esteemed the maximum head, but we have set the larger sizes with a fall of 23 feet (suitably built for the occasion, to be sure), with nearly 200 feet of pipe leading to the Ram and nearly 800 feet of eduction pipe against an elevation of 125 feet and secured very satisfactory results indeed. The accompanying illustration shows a double Ram, which can be often used to advantage, where large quantities of water are required, because the strain on the pipes is not so great as it would be to use one very large Ram, and then, too, in case one Ram is out of repair, the supply of water is not entirely suspended, as the other is working. Double Rams should have two drive and two discharge pipes.

We will illustrate the successful operation of one of our Hydraulic Rams, as reported by an engineer residing on one of the West India Islands; and it will be conceded that we have discovered new and valuable principles, and by successfully utilizing them have broadened the usefulness of this labor-saving automatic device.

Size of Ram used,	No. 7.	
Elevation of Supply above Ram,	23	feet.
Elevation of Delivery above Ram,	118	feet.
Length of Drive or Supply Pipe,	184	feet.
Length of Discharging Pipe,	767	feet.
Water passed through Supplying Pipe per minute,	26⅔	galls.
Water delivered 118 feet above Ram per minute,	4½	galls.

or nearly 1-6 of all that was delivered to the Ram.

We have had many years' experience in hydraulics, and feel well informed concerning such matters, but we must confess to a degree of surprise at the above result, mingled with gratification on account of the perfection to which we have brought this machine by the application of our peculiar ideas and improvements.

We give below prices of the different sizes of Double Rams, as per cut.

Size.	Each Ram will take following quantities of water from source per minute.	Length of Drive Pipe.	CALIBRE OF PIPES		LEATHER VALVES.		BRASS POPPET VALVES	
			Drive.	Dis.	Cipher.	Price.	Cipher.	Price.
No. 6	11 to 25 gallons.	25 to 200 ft.	2½ in.	1¼ in.	Sane	$100.00	Same	$125.00
No. 7	20 to 40 gallons.	25 to 200 ft.	3 in.	2 in.	Sang	170.00	Samp	200.00
No. 8	25 to 75 gallons.	25 to 200 ft.	4 in.	2½ in.	Sap	260.00	Sand	300.00

We solicit inquiries in this department of our business, and shall be glad to answer any inquiries or supply any information in our power.

IMPROVED HYDRAULIC RAM.

FOR THE SUPPLY OF DWELLINGS, FACTORIES, VILLAGES, RAILROAD STATIONS, STOCK YARDS, ETC., WITH RUNNING WATER.

FIG. 345.

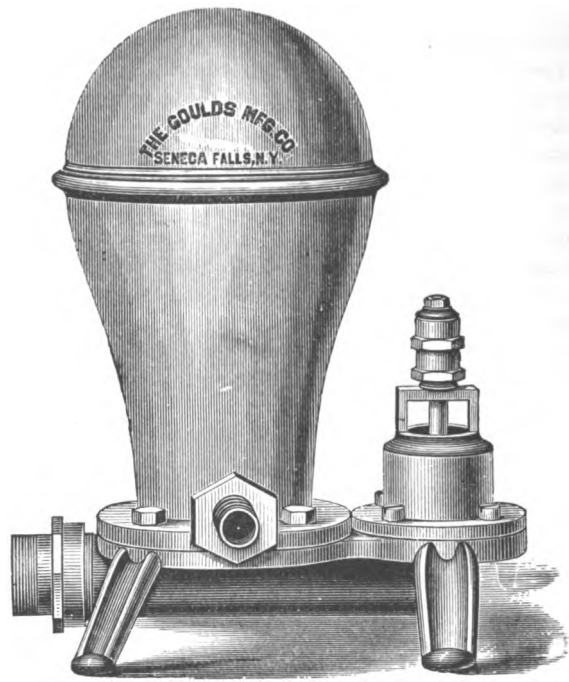


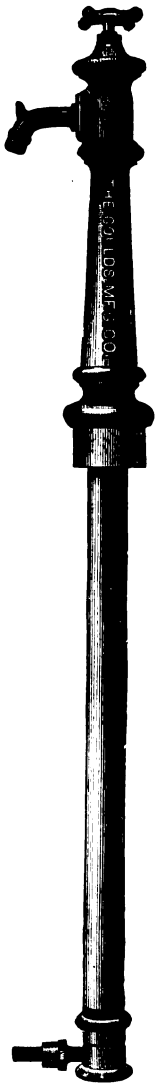
FIG. 345. Sizes, Prices, Etc.

Size.	Quantity of Water furnished per minute by the fountain to which Ram is adapted.	Length of Drive Pipe.	CALIBRE OF PIPES.		Cipher.	Price.
			Drive.	Discharge.		
No. 2	2 quarts to 2 galls.	25 to 50 ft.	¾ inch.	½ inch.	Evade	$ 9.00
No. 3	1½ galls. to 4 galls.	25 to 50 ft.	1 "	½ "	Evan	11.00
No. 4	3 " 7 "	25 to 50 ft.	1¼ "	¾ "	Event	14.00
No. 5	6 " 14 "	25 to 50 ft.	2 "	1 "	Evict	22.00
No. 6	11 " 25 "	25 to 50 ft.	2½ "	1¼ "	Ewe	40.00
No. 7	20 " 40 "	25 to 50 ft.	3 "	1½ "	Ewer	75.00
No. 8	25 " 75 "	25 to 50 ft.	4 "	2 "	Exact	125.00

The size of the pipes should vary in proportion to the distance the water is to be conveyed, as the greater the distance the larger the pipe in proportion to the size of the machine. This applies to the discharge pipe only.

By means of an ADJUSTER applied to each of our Rams, the quantity of water drawn from the fountain may be varied at pleasure—thus readily adapting the machine to a *variable supply*. For further information see page 224.

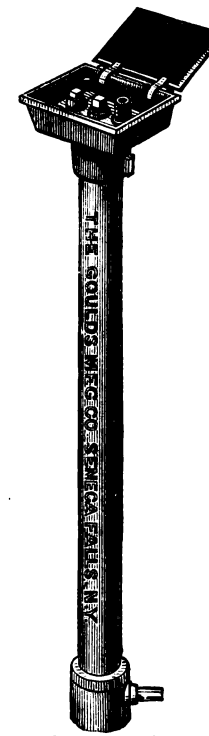
FIG. 646.



"STAR"
HYDRANT AND STREET WASHER.

WITH COMPRESSION VALVES.

FIG. 647.



These goods have been on the market now for several years, and are so familiar to those who have used them, that any description of their superior merits is unnecessary. There is not much opportunity to display constructive taste in a Street Washer, but it is universally conceded that our Hydrant is handsome in design and finish, and is quite an addition to the appearance of a yard or lawn. We have allowed no opportunity to pass to improve both our Hydrants and Washers; and while in general the principle of their mechanism is unchanged, many minor changes and improvements have been made.

They are perfectly anti-freezing. They are made to set in the ground any depth, from eighteen inches to six feet. They are almost instantly opened or closed by means of the double threaded brass screw actuating the valve below. They can be repaired from the top without digging up.

They have a brass swivel or coupling nut (not an iron one), and the tube for service pipe connection is ground to a joint with the valve case elbow.

They readily sell for more money than any others, because no others bear any comparison with them. In fact they are *ne plus ultra*.

It would always be well to have a short piece of lead pipe between coupling and service pipe, as its flexibility will prevent a fracture of the pipe when the frost heaves the ground. We measure from ground line to centre of service pipe inlet.

Street Washer Keys per dozen, $3.60. An Iron *Turn Key* goes with each Street Washer.

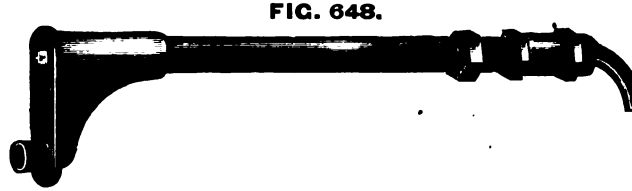
We guarantee every one to be thoroughly tested before leaving our factory.

FIGS. 646 and 647. Sizes, Prices, Etc.

Length to set in the Ground.	FIG. 646. ¾ inch.		FIG. 647. ¾ inch.		FIG. 646. 1 inch.		FIG. 647. 1 inch.	
	Cipher.	Price.	Cipher.	Price.	Cipher.	Price.	Cipher.	Price.
18 in.	Veneering	$9.25	Venger	$7.75	Ventana	$11.75	Veracity	$9.25
24 "	Venefice	9.50	Venial	8.00	Venter	12.00	Veranda	9.50
30 "	Venomous	9.75	Venison	8.25	Ventilate	12.25	Verb	9.75
36 "	Venene	10.00	Venom	8.50	Ventilator	12.50	Verbal	10.00
42 "	Venerate	10.50	Venous	9.00	Venture	13.00	Verbality	10.50
48 "	Venerator	11.00	Vent	9.50	Venue	13.50	Verbatim	11.00
54 "	Veney	11.50	Ventage	10.00	Venulose	14.00	Verbiage	11.50
60 "	Venge	12.00	Ventail	10.50	Venus	14.50	Verbose	12.00
72 "	Vocal	13.00	Vocalist	11.50	Vocalic	15.50	Vocality	13.00

"STAR"
WALL HYDRANT AND WASHER.
WITH COMPRESSION VALVE.

FIG. 648.



The above cut represents our new design Wall Hydrant and Washer with compression valve, made of solid brass, with 1 inch wrought-iron connecting pipe and wrought-iron rods.

We would call the attention of plumbers and builders to the merits of this Hydrant, which can be operated from the outside, and opened and closed from same place.

Its entire length is 27 inches, being made long enough to pass through any wall up to 23 inches thick, while it is held in place by screwing up the jamb nut against the wall.

The connection is effected on the inside by means of a brass swivel or coupling nut and elbow fitted for lead pipe, while the hub on the outside is cut for either ¾ or 1 inch hose coupling, as ordered.

The valve is opened and closed against a brass valve seat by means of a double threaded brass screw, operated by a key, which we furnish. In many cases this will be found more convenient to put in than a Hydrant, and it offers no obstruction in the yard or lawn.

FIG. 648. Size and Price.

Brass to take ¾-inch Hose, ... (Verdancy.) . . . $7.50
Nickle-plated, to take ¾-inch Hose, ... (Verdant.) . . . 8.50

Can furnish for 1-inch hose at same price, if so ordered. Longer lengths made to order at an increase in price.

NEW ADJUSTABLE CURB BOX.
FOR OPENING OR CLOSING COCK IN SERVICE PIPE.

FIG. 649.

The cut shows our New Adjustable Curb Box for opening or closing cock in service pipe, as many times becomes necessary in making repairs or changes in the pipes in buildings or in hydrants in yards. The cut will need but little explanation to practical men, as it will be readily understood and appreciated.

The outside case is made of cast-iron and is 22 inches high, while through this can be moved to any desired length the piece of 1-inch pipe enclosing rod. The lower end of this rod is forked in proper shape to take and turn the lever of service or corporation cock and the upper end flattened so it can be operated with such wrenches as plumbers use.

To prevent these boxes being tampered with while in use the top is protected by a neat cap, as shown in the cut, which can be removed and replaced at pleasure only by those using.

We believe the convenience of this device will be appreciated by all having use for such an article, as it is operated directly and surely from the surface, thus avoiding all the delays and troubles of the old way.

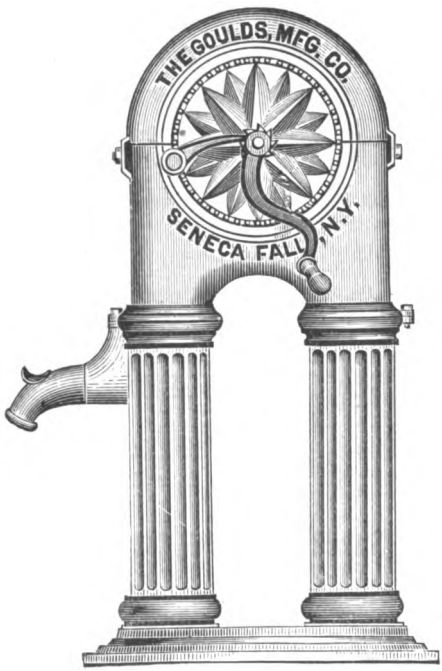
FIG. 649. Size and Price.

Size Pipe.	Length Pipe.	Length Rod.	Extreme Length.	Cipher.	Price.
1 inch.	42 inch.	43 inch.	62 inch.	Vicar	$3.00

Wrought-Iron Keys, each, ... $0.75

IRON COLUMN CURB FOR CHAIN PUMPS.

FIG. 347.



The cut represents our style of Iron Curb, made by us for the Chain Pump. It is a most admirable and complete device, combining ornament with utility, and is without a rival in the market.

They have been some time before the community, and are generally known, and from actual test have continued to grow more and more in favor and demand, and need only to be seen to secure a ready approval.

Price.

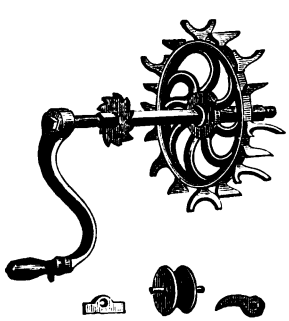
FIG. 347, Iron Column, Curb, . . (Exile.) . . . $9.00

Galvanized Pump Chain for Chain Pumps, with 1¼ and 1½ inch buckets, furnished at lowest market rates.

CHAIN PUMP REELS.

FOR CHAIN PUMPS.

FIG. 348.



This cut represents our much improved sixteen forked Reel. It is a very smooth and substantial article, possessing considerable advantage over the ordinary reel.

We also make the old style of eight forked Reels, which are so well known.

Prices.

Eight Forked Reels, per doz., . (Exist.) $10.00
Sixteen Forked Reels, per doz., (Exit.) 11.00
Extra Rollers, per dozen, ... 1.50

STANDARD RUBBER HOSE.

Internal diameter, inches,	½	¾	1	1¼	1½	1¾	2	2¼	2½	3
2 Ply Conduc'g, price per ft.	$ .20	$ .25	$ .33	$ .42	$ .50	$ .58	$ .66	$ .75	$ .83	$ .99
3 Ply Hydrant, "	.25	.30	.40	.50	.60	.70	.80	.90	1.00	1.20
4 Ply Engine, "	.30	.37	.50	.62	.75	.87	1.00	1.12	1.25	1.50

5 Ply made to order at an advance of 25 per cent. on 4 ply prices.

HARD RUBBER SUCTION HOSE.

This Suction Hose is intended for Pumps; it will not collapse and will be found a reliable and durable article.

Internal diameter, inches,	¾	1	1¼	1½	1¾	2	2½
Price per foot,	$ .65	$ .75	$ .93	$1.13	$1.31	$1.50	$1.88

RUBBER SPIRAL SUCTION HOSE.

Internal diameter, inches,	¾	1	1¼	1½	2	2½	3	3½	4
Price per foot,	$ .77	$1.00	$1.25	$1.65	$2.50	$3.10	$4.00	$4.90	$5.80

PATENT "SMOOTH BORE" RUBBER SUCTION HOSE.

This Hose is strengthened by a flat galvanized iron spirally wound, which is *embedded* in the rubber out of sight, thus combining all the advantages of a spiral hose and a perfectly smooth interior.

Internal diameter, inches,	2	2½	3	3½	4
Price per foot,	$2.60	$3.50	$4.50	$5.50	$6.50

SEAMLESS LINEN HOSE, UNLINED.

Internal diameter, inches,	1	1¼	1½	1¾	2	2¼	2½	3
Price per foot,	$ .20	$ .22	$ .25	$ .28	$ .30	$ .33	$ .35	$ .50

SEAMLESS LINEN HOSE, RUBBER LINED.

Internal diameter, inches,	1¼	1½	2	2¼	2½
Price per foot,	$ .50	$ .55	$ .65	$ .70	$ .75

COTTON HOSE—SEAMLESS WOVEN AND RUBBER LINED.

Internal diameter, inches,	1	1½	2	2¼	2½
Price per foot,	$ .40	$ .50	$ .60	$ .65	$ .70

HOSE NOZZLES, TO TIE ON.

FIG. 502.

Size, inches. . .	¾ x 3½	1 x 4	1¼ x 4¼
Price, per doz., .	$3.50	$4.50	$6.50

HOSE PIPES, PLAIN. SCREW TIP.

FIG. 499.

Size, inches, .	¾ x 6	1 x 7¼	1 x 12
Price, per doz.,	$8.00	$9.00	$12.00

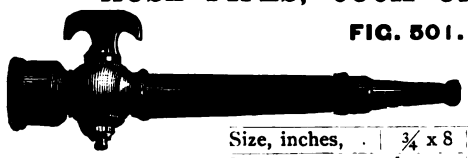
HOSE PIPES, PLAIN. SCREW TIP. (Large Size.)

FIG. 496.

Size, inches, ...	1¼ x 12½	1½ x 18	2 x 23	2½
Price, per doz., . . .	$21.00	$25.00	$40.00	$60.00

HOSE PIPES, COCK ON LARGE END.

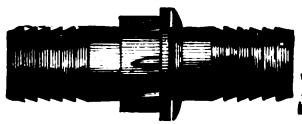
FIG. 501.



Size, inches, .	¾ x 8	1 x 12	1¼ x 22	1½ x 24	2 x 30
Price, per doz.,	$13.00	$18.00	$40.00	$78.00	$136.00

HOSE COUPLINGS FOR RUBBER HOSE.

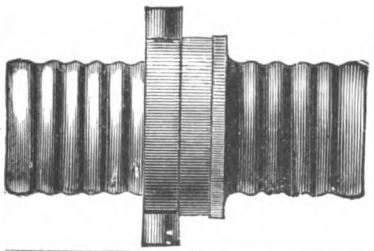
FIG. 504.



Size, inches, . .	½	¾	1
Price, per doz., .	$2.40	$2.40	$4.40

HOSE COUPLINGS FOR RUBBER HOSE, WITH LUGS.

FIG. 497.



Size, inches,	1¼	1½	2	2½
Price, per doz.,	$10.00	$14.00	$24.00	$48.00

HOSE PIPE SPRINKLERS.

FIG. 503.

Diam. of Face, inches, .	1⅝	1⅝	2⅜	2⅜	2¾
Size Hose Pipe, inches, .	¾	1	1¼	1½	2
Price, per doz., ...	$3.50	$3.50	$6.00	$6.00	$9.00

BRASS SUCTION BASKET. TO TIE ON.

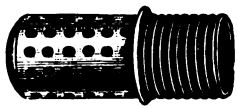


FIG. 750.

Size, inches,	¾	1	1¼	1½	2
Price, each,	$2.50	$3.00	$3.25	$4.00	$5.00

BRASS SUCTION BASKET.

TO SCREW ON.

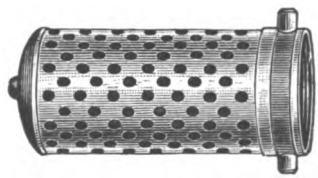


FIG. 751.

Size, inches,	1½	2	2¼	2½	3	3½
Price, each,	$4.00	$5.00	$6.00	$7.00	$10.00	$15.00

GLOBE SUCTION BASKET.

TO TIE ON.

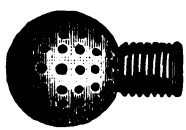


FIG. 622.

Size, inches,	1	1¼	1½	2
Price, each, Galvanized Iron,	$ .50	$ .60	$ .75	$1.25
Price, each, Brass,	$2.00	$2.25	$2.75	$3.50

COMPRESSION PLAIN BIBBS, BRASS.

SCREWED FOR IRON PIPE.

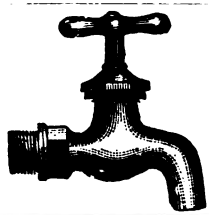


FIG. 723.

Size, inches,	⅜	½	⅝	¾	1 in.
Price, per doz.,	$10.00	$11.00	$13.00	$20.00	$37.00

FINISHED PLAIN BIBBS, BRASS.

SCREWED FOR IRON PIPE.

FIG. 724.

Size, inches,	½	⅝	¾	1	1¼	1½
Price, doz.,	$15.00	$18.00	$24.00	$36.00	$60.00	$84.00

BRASS STEAM COCKS.

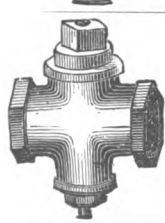


FIG. 725.

Size, inches,	¼	⅜	½	¾	1
Price, each,	$0.70	$0.75	$1.10	$1.50	$2.25
Size, inches,	1¼	1½	2	2½	3
Price, each,	$3.75	$4.80	$7.25	$14.00	$20.00

BRASS THREE-WAY COCKS.

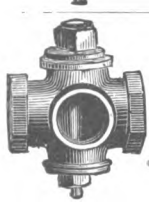


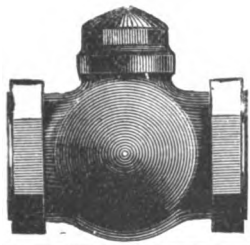
FIG. 726.

Size, inches,	½	¾	1	1¼	1½	2
Price, each,	$1.65	$2.25	$3.40	$5.50	$7.00	$10.00

GAS SERVICE WATER COCKS, BRASS.

FIG. 727.

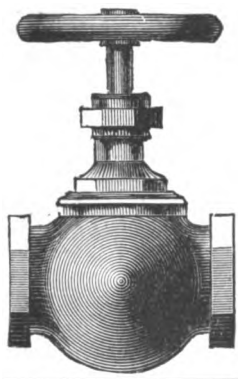
Size, inches,	¼	⅜	½	¾	1	1¼	1½	2
Price, each,	$ .55	$ .65	$ .75	$1.00	$1.40	$2.20	$3.00	$5.00



BRASS HORIZONTAL CHECK VALVE.

FIG. 752.

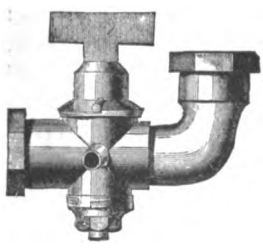
Size, inches,	½	¾	1	1¼	1½	2
Price, each,	$ .85	$1.15	$1.55	$2.30	$3.25	$5.20



BRASS GLOBE VALVE.

FIG. 753.

Size, inches,	½	¾	1	1¼	1½	2
Price, each,	$1.00	$1.35	$1.80	$2.80	$3.90	$5.90



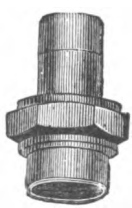
BRASS HYDRANT COCK.

T HANDLE.

FIG. 754.

Size, inches,	½	⅝	¾	1
For lead pipe, both ends, per doz.,	$14.00	$16.00	$21.00	$33.00
For iron pipe, per doz.,	16.00	. .	24.00	39.00
For iron and lead pipe, per doz.,	15.00	16.50	23.00	36.00

BRASS SOLDERING NIPPLES AND UNIONS.

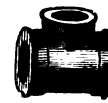


Size, inches,	½	¾	1	1¼	1½	2
Soldering Nipples, per doz.,	$2.50	$3.00	$5.00	$7.50	$10.00	$14.00
Soldering Unions, per doz.,	3.25	4.00	6.00	8.50	12.00	18.00

WROUGHT-IRON PIPE FITTINGS.


Elbow.


45 deg. Elbow.


Tee.


Cross.


Coupling.


Reducer.


Cap.


Plug.

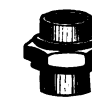

Bushing.


Nipple, Short.


Nipple, Long.


Return Bends, Close.


Locknut.


Union.

Size of Pipe, inches,	¼	⅜	½	¾	1	1¼	1½	2	2½	3
Elbows,	$ .04	$ .05	$ .06	$ .09	$ .13	.20	$ .25	$ .40	$ .75	$1.10
45° Elbows,	. .	.10	.10	.15	.20	.26	.35	.50	1.30	1.60
Tees,	.06	.07	.09	.13	.20	.30	.38	.60	1.10	1.50
Crosses,	.08	.10	.12	.18	.28	.40	.50	.80	1.50	2.20
Couplings, plain,	.05	.06	.07	.10	.13	.17	.21	.28	.40	.60
Couplings, galvanized,	. .	.08	.10	.13	.20	.25	.35	.40	.60	.80
Caps,	.03	.03	.05	.08	.11	.15	.22	.30	.50	.80
Plugs,	.03	.03	.04	.05	.06	.10	.13	.20	.35	.50
Bushings,	. .	.05	.06	.07	.09	.13	.17	.27	.42	.60
Nipples, short,	.05	.06	.07	.09	.10	.14	.17	.25	.56	.75
Nipples, long,	.07	.09	.10	.11	.15	.20	.25	.35	.75	.95
Return Bends, close,	. .	. .	.10	.15	.22	.34	.45	.75	1.50	2.25
Locknuts,	.30	.35	.40	.55	.75	1.00	1.30	1.70	2.70	3.70
Unions,	.15	.18	.20	.28	.34	.46	.60	.80	1.50	2.10

WROUGHT-IRON STEAM, GAS AND WATER PIPE.

REVISED AND ADOPTED JUNE 11, 1884.

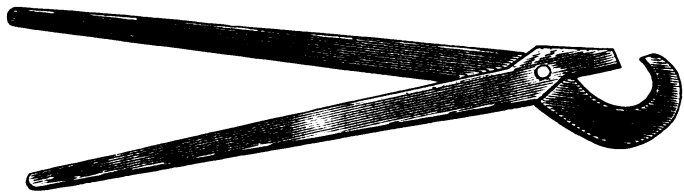
	Size.	Price per Foot, Black.	Price per Foot, Galvanized.	Weight per Foot, Nominal.	Outside Diameter Standard.	No. of Thread per Inch of Screw.
Butt-welded.	⅛ in.	$ .03¼	. . . .	.24 lbs.	.40 in.	27
	¼ "	.03¼	$ .05	.42 "	.54 "	18
	⅜ "	.03¾	.05½	.56 "	.67 "	18
	½ "	.04¾	.06	.85 "	.84 "	14
	¾ "	.06	.08	1.12 "	1.05 "	14
	1 "	.08	.10½	1.67 "	1.31 "	11½
	1¼ "	.11	.14	2.25 "	1.66 "	11½
Lap-welded.	1½ "	.21	.24	2.68 "	1.90 "	11½
	2 "	.26	.30	3.61 "	2.37 "	11½
	2½ "	.42	.47	5.74 "	2.87 "	8
	3 "	.55	.62	7.54 "	3.50 "	8
	3½ "	.67	.83	9.00 "	4.00 "	8
	4 "	.83	1.00	10.66 "	4.50 "	8

Above lists and all quotations subject to change without notice.

COMMON PIPE TONGS.

MADE EXTRA HEAVY AND STRONG.

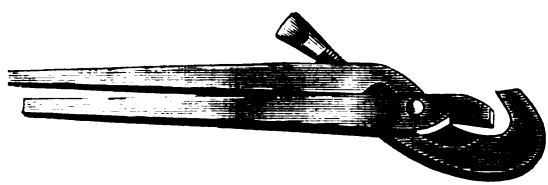
FIG. 373.



Size, inches,	⅛	¼	⅜	½	¾	1	1¼
Price, each,	$ .68	$ .68	$ .72	$1.00	$1.10	$1.30	$1.50
Size, inches,	1½	2	2½	3	3½	4	5
Price, each,	$1.60	$2.00	$3.50	$4.20	$5.00	$6.00	$8.00

BROWN'S PATENT ADJUSTABLE PIPE TONGS.

FIG. 377.



No. 1	takes from	⅛ to ¾ inch pipe,	$1.00
No. 1½	"	⅜ to 1 "	1.25
No. 2	"	½ to 1¼ "	1.50
No. 3	"	1 to 2 "	2.00
No. 4	"	1½ to 3 "	4.00
No. 5	"	2½ to 4 "	6.75
No. 6	"	3 to 5 "	18.00
No. 7	"	4 to 7 "	25.00

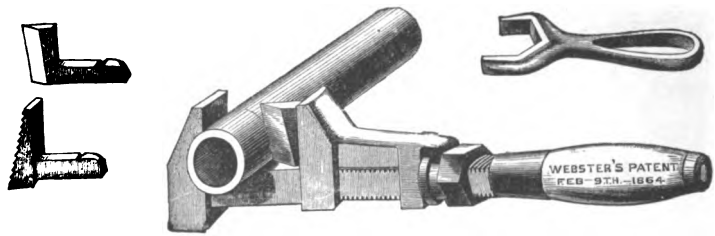
ACME CUBE PIPE TONGS.

FIG. 730.

No. 1	Grips,	⅛ to ¾ inch,	$3.00
No. 1½	"	¼ to 1¼ "	3.50
No. 2	"	¼ to 1½ "	4.00
No. 3	"	½ to 2½ "	5.00
No. 4	"	¾ to 4 "	9.00

WEBSTER'S PATENT WRENCH, PIPE WRENCH, AND PIPE CUTTER.

FIG. 371.

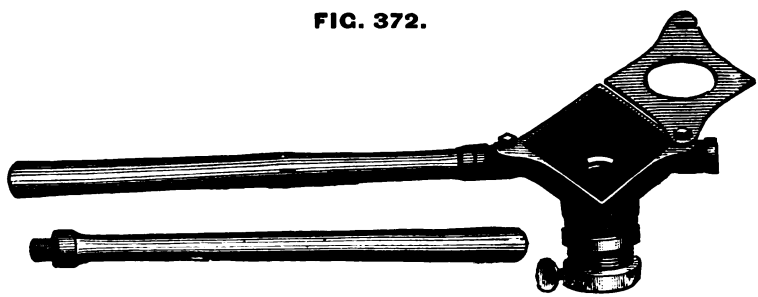


12 inch, with cutter, etc., for	⅛ to ¾	inch pipe,	. . . . .	$4.00
15 " "	⅛ to 1½	"	. . . . .	5.00
18 " "	⅛ to 2	"	. . . . .	6.00
21 " "	⅛ to 2½	"	. . . . .	7.00

MALLEABLE IRON SCREWING STOCK.

WITH WROUGHT-IRON SCREW HANDLES.

FIG. 372.



Price.

Gas Pipe Stock, with one solid Die, either ¾, 1 or 1¼ inches, as ordered, each, ... $10.00
Extra Dies, each, ... 3.00
Extra Bushings, each, ...40

We can also furnish these Stocks and Dies for cutting both smaller and larger sizes of pipe, at regular market prices.

PIPE PULLER.

FOR PULLING OUT PIPE WHEN BROKEN OFF UNDER THE GROUND.

FIG. 511.

Price, fitted for ¾ inch pipe, to pull 1¼ inch pipe, each, ... $5.00

A represents main shank fitted for ¾ *gas pipe*, the *lower* end being the largest. *B* is a *steel dog* in which *attach a cord* to hold up while inserting into pipe. When down into the pipe let loose of the cord and the *slot C* will allow plate *B* to drop and fill the pipe, so that the harder you pull on the main shaft *A*, the tighter *A* and *B* will grip the inside of the pipe.

ROBBIN'S PATENT CHAIN TONGS.

FIG. 755.

No.	Length of Lever.	Size of Chain.	Weight.	Size of Pipe Adapted to	Price.
2	27 in.	5-16 in.	7 lbs.	1 to 2 in.	$ 5.50
3	36 "	5-16 "	12 "	1¼ to 4 "	6.25
4	36 "	⅜ "	24 "	2 to 6 "	9.00
5	36 "	½ "	33 "	2½ to 8 "	12.50

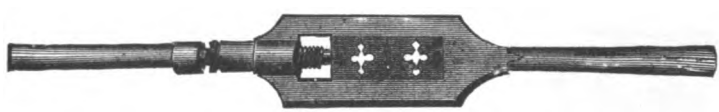
BAXTER'S ADJUSTABLE WRENCH.

FIG. 756.

Size, inches,	4	6	8	10	12
Price, . .	$0.50	$0.75	$1.00	$1.50	$2.00

PUMP STOCK AND DIE.

FIG. 757.



Pump Rod Stock and Dies, ⅜ inch, 14 threads; 7-16 inch, 12 threads, . . $6.00

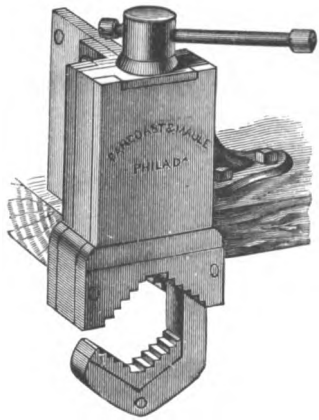
STANWOOD'S PATENT PIPE CUTTER.

FIG. 512.

No.	Cuts Pipe.	PRICE.		Cutter Blocks with Wheels.	Wheels.
		Case hardened.	Steel faced.		
1	⅛ to 1	$1.50	$1.75	$0.35	$0.10
2	1 to 2	2.25	2.50	.50	.15
3	2 to 3	7.00	7.50	.90	.20

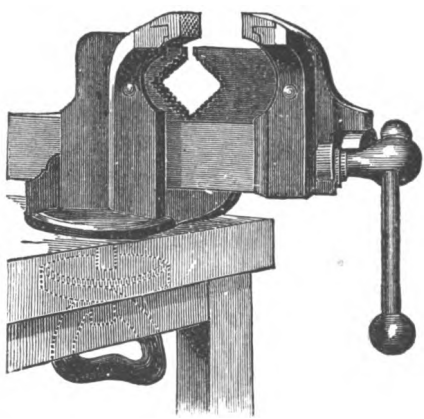
IMPROVED PIPE-FITTERS' VISE.

FIG. 697.



This is the only Pipe Vise that can be used either with Angle Plate or between the Jaws of any Machinist's Vise.

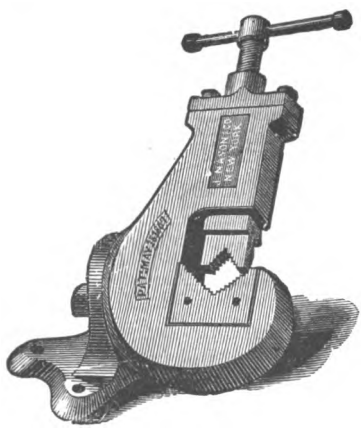
Price, complete with angle plate, . . $8.00



COMBINATION BENCH VISE.

FIG. 732.

No. 1 holds ⅛ to 2 inch pipe, $16.00
No. 2 " ½ to 3 " 20.00



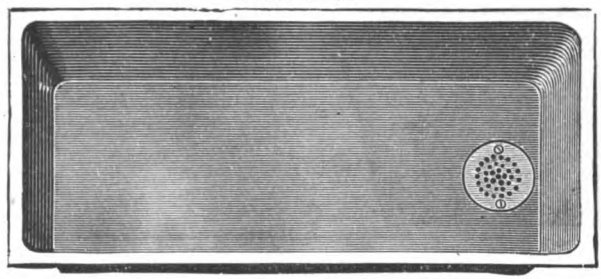
NASON'S PIPE VISE.

FIG. 558.

No. 1 holds ⅛ to 1¼ inch pipe, . . $15.00
No. 2 " ⅛ to 2 " . . 18.00
No. 3 " ¼ to 3 " . . 30.00

PLUMBERS' SQUARE SINKS.

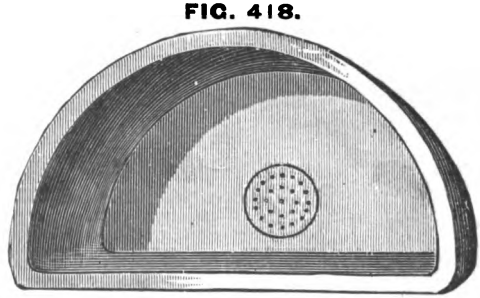
FIG. 428.



No.	Size.	Depth.	Cipher.	Painted.
1	13 x 19 in.	5 in.	Pess	$1.75
2	14 x 20 "	6 "	Pest	2.20
3	14 x 24 "	6 "	Prize	2.30
4	15 x 23 "	6 "	Phiz	2.40
5	16 x 24 "	6 "	Pica	2.70
6	15 x 25 "	6 "	Pick	2.75
7	15 x 27 "	6 "	Pico	2.90
8	16 x 28 "	6 "	Pied	3.20
9	16 x 30 "	6 "	Pier	3.50
10	18 x 24 "	6 "	Prim	2.80
11	18 x 30 "	6 "	Pike	3.75
12	20 x 30 "	6 "	Pile	4.00
13	18 x 32 "	6 "	Pill	4.25
14	18 x 36 "	6 "	Pine	4.75
15	19 x 38 "	6 "	Pink	5.60
16	20 x 36 "	6 "	Pint	5.25
17	20 x 40 "	6 "	Pipe	6.00
18	18 x 42 "	6 "	Pith	6.25
19	20 x 42 "	6 "	Pity	6.50
20	22 x 42 "	6 "	Plan	6.75
21	24 x 48 "	6 "	Plat	8.00
22	24 x 50 "	6 "	Play	8.50

HALF CIRCLE SINKS.

FIG. 418.



No.	Back.	Width.	Depth.	Cipher.	Painted.
1	24 in.	14 in.	6 in.	Plug	$2.50
2	27 "	14 "	6 "	Plum	3.75

SLOP SINKS.

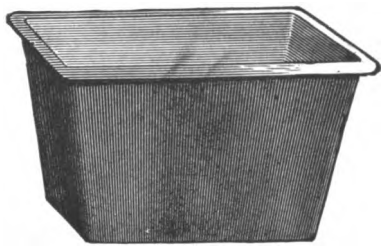


FIG. 419.

No.	Size.	Depth.	Cipher.	Painted.
1	16 x 16 in.	10 in.	Pole	$4.00
2	20 x 14 "	12 "	Poll	5.00
3	24 x 20 "	12 "	Pore	6.00

CORNER SINKS.

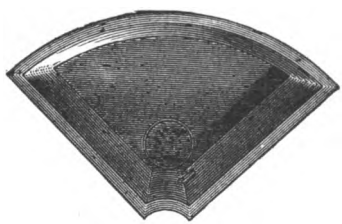


FIG. 429.

No.	Sides.	Front.	Depth.	Cipher.	Painted.
1	20 in.	28 in.	6 in.	Poet	$2.50
2	22 "	31 "	6½ "	Poke	3.15

IMPROVED SEWER TRAP AND SLOP SINK.

WITH TRAP AND STRAINER.

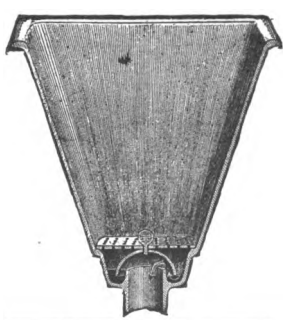


FIG. 416.

No.	Size.	Depth.	Outlet.	Cipher.	Price.
1	12 x 12 in.	6 in.	2 in.	Post	$2.25
2	15 x 15 "	11½ "	2 "	Pour	3.35
3	18 x 18 "	12 "	3 "	Pout	4.25
4	20 x 20 "	12 "	3 "	Pray	5.25

SEWER TRAPS.

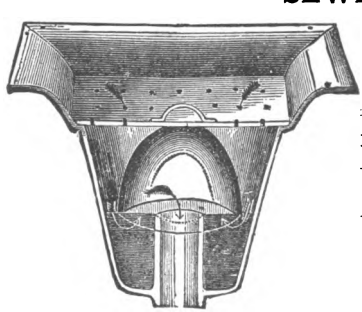


FIG. 403.

No.	Size.	Depth.	Outlet.	Cipher.	Price.
1	16 x 16 in.	8 in.	2 in.	Pumd	$3.50
2	16 x 16 in.	8 in.	2 in.	Punt	5.00

No. 2 is extra heavy and strong.

HYDRANT CESS POOLS.

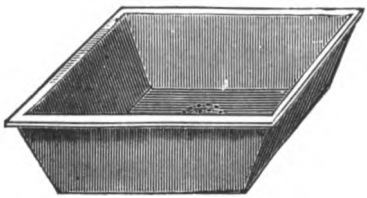


FIG. 420.

No.	Size.	Depth.	Outlet.	Cipher.	Price.
1	12 x 12 in.	6 in.	4 in.	Pork	$1.80
2	14 x 14 "	6 "	4 "	Port	2.00
3	16 x 16 "	6 "	4 "	Pose	2.50

Can furnish above with 5 inch outlet, when so ordered,

HYDRANT CESS POOLS.

WITH BELL TRAPS.

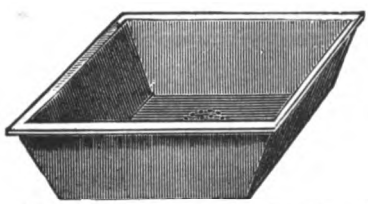
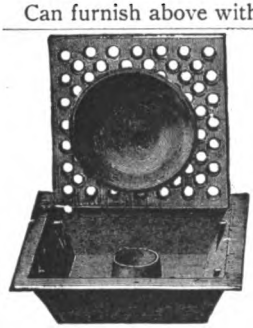


FIG. 421.

No.	Size.	Depth.	Outlet.	Cipher.	Price.
1	12 x 12 in.	6 in.	4 in.	Puck	$2.25
2	14 x 14 "	6 "	4 "	Puff	2.65
3	16 x 16 "	6 "	4 "	Pull	3.25

Can furnish above with 5 inch outlet, when so ordered,



CELLAR TRAPS.

FIG. 417.

No.	Size.	Depth.	Outlet.	Cipher.	Price.
1	9 x 9 in.	2¼ in.	2 in.	Prod	$1.25
2	12 x 12 "	2¼ "	2 "	Prop	1.75

OPEN SINK STRAINERS.

FIG. 435.

	Diameter.	Cipher.	Price.
Plain, per doz., . .	4¾ in.	Pulp	$2.00

OPEN END SINK COUPLINGS.

FIG. 434.

	Cipher.	Price.
Plain, per doz., for lead pipe, .	Prow	$2.00

We can furnish Sink Couplings for iron pipe when so ordered at $4.00 per dozen.

SINK TRAPS.

FIG. 404, Sink Traps, per doz., $4.00

SINK BOLTS.

Per dozen, ...	$ .75
Per package, ...	3.75

IMPROVED STEEL AMALGAM BELLS.

COMPLETE WITH HANGINGS, AS SHOWN IN THE CUT.

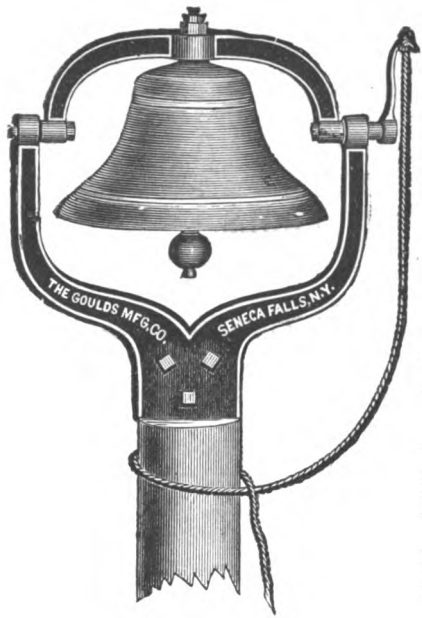


FIG. 352.

Fig. 352 represents our Steel Amalgam Bells so celebrated, and which are especially adapted to farms, plantations, school houses, factories, etc.

Every farm or plantation should have a bell, for the following reasons:

1st. Because the workmen are often prevented by winds or distance from hearing the dinner horn or hand bell.

2d. It sounds cheerful and neighborly to hear the bells clang out over the country.

3d. By a series of signals, previously arranged, either the proprietor or all the men can be brought to the house in a few moments.

4th. In case of fire, or any calamity, the bell can call together the whole neighborhood in a short time.

FIG. 352. Sizes, Prices, Etc.

No.	Diameter.	Weight Bell only.	Weight complete.	Cipher.	Price.
1	15½ inches.	38 lbs.	62 lbs.	Ferry	$ 6.00
2	16½ "	51 "	77 "	Fetch	8.00
2½	17½ "	57 "	86 "	Fend	9.00
3	18½ "	65 "	102 "	Fiat	10.00
4	21 "	80 "	132 "	Fibre	12.00
5	24 "	134 "	180 "	Field	20.00

NEW STEEL AMALGAM BELLS.

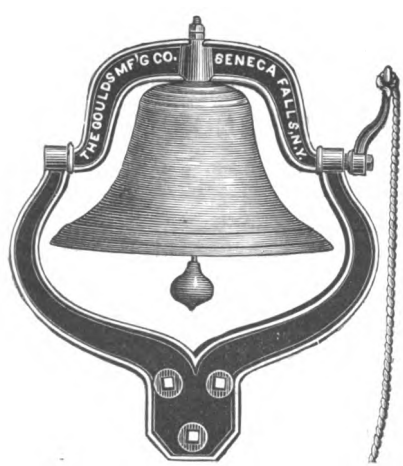


FIG. 758.

Fig. 758 represents our new pattern Steel Amalgam Bells, which we have just perfected and are prepared to furnish at greatly reduced prices.

We believe they are superior to many more expensive makes, and that they will fully sustain the high standard of the "Gould" Bell and give the best satisfaction. We solicit a trial and comparison.

FIG. 758. Sizes, Prices, Etc.

No.	Diameter.	Weight Complete.	Cipher.	Price.
A 1	15 in.	40 lbs.	Vaporing	$ 4.00
A 2	17 "	50 "	Vaporize	5.00
A 3	19 "	75 "	Vapory	7.50
A 4	21 "	100 "	Varanus	10.00

SPANISH-AMERICAN STEEL AMALGAM BELLS.

FIG. 354.

These bells are made so as to be fastened from the top and to remain stationary. They are to be rung by a cord fastened in the eye at the end of the clapper.

A cheap bell has long been desired; for calling men to dinner, when working some distance from the house; for giving alarm of fire, or any other casualty; indeed, there are almost innumerable instances where the article could be called into use; and at the very low price at which we offer them they are placed within the reach of all. No Farm, Plantation or Factory should be without one of Goulds Celebrated Bells.

FIG. 354. Sizes, Prices, Etc.

No.	Diameter.	Weight Bell only.	Cipher.	Price.
1	15½ inches.	38 lbs.	Fagot	$ 4.80
2	16½ "	51 "	Fail	6.00
2½	17½ "	57 "	Fain	7.00
3	18½ "	65 "	Faint	7.75
4	21 "	80 "	Fell	10.00
5	24 "	134 "	Felt	14.00
6	28 "	247 "	Fen	30.00
7	30 "	325 "	Fence	36.00
8	33 "	414 "	Fern	55.00

LARGE STEEL AMALGAM BELLS.

WITH HANGINGS AND FRAME COMPLETE.

FIG. 353.

Fig. 353 represents our Steel Amalgam Bells as we mount them in the larger sizes for churches, school houses, factories, engine houses, etc. We have sent thousands of these Bells to various portions of the United States, as their cheapness places them in the reach of any church, and they have always given splendid satisfaction.

We send them all to market richly gilded.

We put tolling attachments on Nos. 6, 7 and 8.

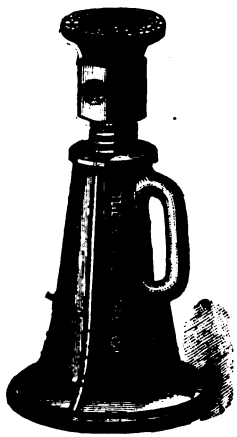
FIG. 353. Sizes, Prices, Etc.

No.	Diameter.	Weight of Bell only.	Weight Complete.	Size of Frame.	Cipher.	Price.
3	18½ in.	65 lbs.	172 lbs.	27 x 41½ in.	Fabric	$16.00
4	21 "	80 "	186 "	30 x 41½ "	Fabrile	20.00
5	24 "	134 "	240 "	32½ x 41½ "	Fable	25.00
6	28 "	247 "	396½ "	36 x 48 "	Face	40.00
7	30 "	325 "	487 "	36 x 48 "	Fact	50.00
8	33 "	414 "	689½ "	38 x 48 "	Fade	75.00

Tolling attachments for Nos. 6 and 7, extra, ... $4.00

" " " No. 8, extra, ... 5.00

WROUGHT IRON JACK SCREWS.



WITH IRON STANDS. LOOSE OR SWIVEL CAPS.

FIG. 383.

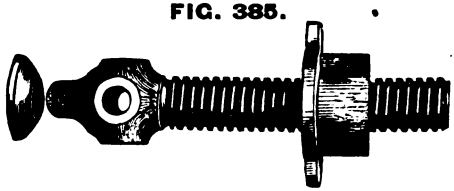
Diameter of Screw.	Length of Screw.	Thread Cut.	Will Raise.	Cipher.	Price.
1½ in.	11 in.	8 in.	6 in.	Fitch	$ 6.00
1¾ "	12 "	9 "	7 "	Fitz	7.00
2 "	15½ "	12 "	9 "	Five	10.00
2½ "	17½ "	14 "	10 "	Fix	14.00
3 "	20 "	16 "	12 "	Flag	16.00

In ordering, be sure to mention whether you want loose or swivel caps, for we make them both ways.

CAST IRON JACK SCREWS.

WITH NUT TO LET INTO WOODEN BLOCK.

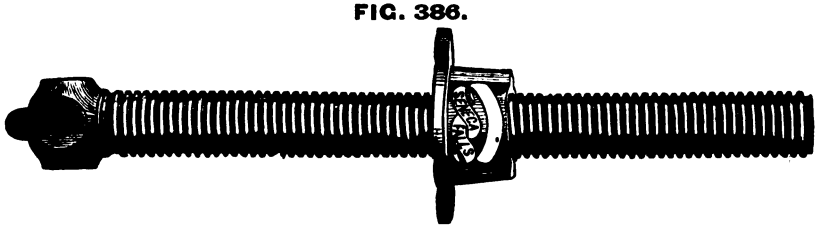
FIG. 385.



3 inches diameter, 24 inches long, cast threads, each, . . . (Finch) . . $6.00

WROUGHT IRON CHEESE, CIDER AND WINE PRESS SCREWS.

FIG. 386.



2¼	inches diameter,	36	inches long,	. . . . .	(Peel.)	$13.25
2¾	" "	36	" "	. . . . .	(Peep.)	17.00
2¾	" "	42	" "	. . . . .	(Peer.)	18.75
3	" "	36	" "	. . . . .	(Pelt.)	23.75
3	" "	48	" "	. . . . .	(Pent.)	27.50
4	" "	48	" "	. . . . .	(Peon.)	37.50
4	" "	60	" "	. . . . .	(Pert.)	40.00

Screws of any length or size made to order.

CAST IRON CIDER PRESS SCREWS.

4 inches diameter, and 4 feet long, ... (Fiend.) $15.00

IMPROVED WAGON JACK SCREWS.

FIG. 380.

The cut exhibits a Wagon Jack Screw which requires only an examination to be appreciated. The Screw is made of wrought iron, with cap or swivel top, nicely turned and fitted, and cast-iron stand.

These Screws are well adapted for raising large and heavy wagons, and are extensively used by teamsters and others on the overland and military routes.

FIG. 380. Sizes and Prices.

No. 1,	1¼ in. screw,	Standard,	12½ in. high,	. . .	$4.00
No. 2,	1¼ "	"	12½ "	and lever,	4.50
No. 3,	1¼ "	"	15½ "	"	5.00
No. 4,	1¼ "	"	16½ "	"	5.50

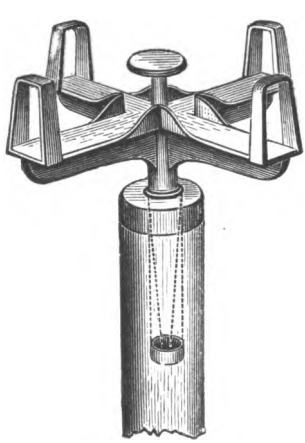
WINE OR LARD PRESS SCREWS.

FIG. 379.

1¼ x 18,	. . (Firm.)	. . .	$5.75
1½ x 18,	. . (First.)	. . .	6.00
1¾ x 24,	. . (Fish.)	. . .	6.75

CAST IRON REVOLVING CLOTHES REEL.

FIG. 414.



The cut shows our improved Revolving Clothes Reel. It is very strong, and with the wood arms inserted, makes a very convenient arrangement for drying clothes.

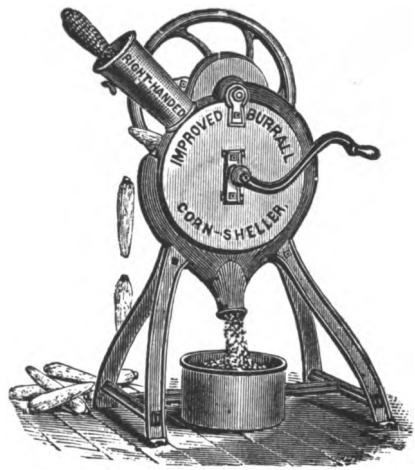
Price.

FIG. 414 per dozen, . . (Fled.) . . $15.00

GOULDS' IMPROVED BURRALL'S PATENT CORN SHELLER AND SEPARATOR.

RIGHT-HANDED.

FIG. 430.



We would call your attention to our New Pattern Right-Handed Patent Burrall Corn Sheller, which we are now ready to place on the market. The hopper is on the left side of the machine, as you face the crank, and can therefore be operated by the right and fed by the left hand, so that one man can both work and feed the Sheller. The wheels, boxes, etc., are the same as our other Sheller, the only difference being in the sides, with which exception the repairs of one will fit the other. We manufacture the only genuine Burrall Sheller, and would warn the Trade to look out for spurious machines. It will shell any sized corn by regulating the spring in the hopper.

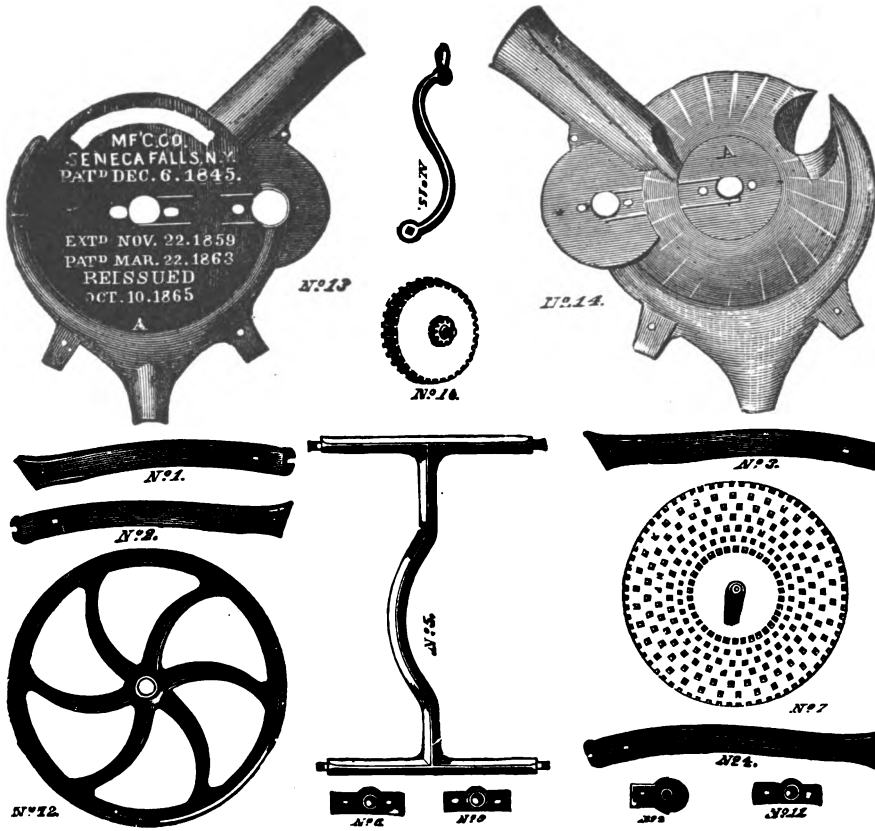
Care should be taken to get the spring properly in its place in case it should be necessary to take it out. We always, in case of packing, make the cost of package as reasonable as possible. The cuts of the different parts composing a Sheller, as shown on the next page, will be found very useful to parties having occasion to order repairs. Get only the Burrall Sheller with our name on, and avoid trouble in getting repairs.

Price, ... (Flew.) $8.00

We can pack from six to eight in an ordinary hogshead, or one or two in a case.

CORN SHELLER PIECES.

FIG. 431.



No. 1, Leg,	$0.35
No. 2, Leg,	.35
No. 3, Leg,	.35
No. 4, Leg,	.35
No. 5, Cross Bar,	.60
No. 6, Shell Wheel Box, flat side,	.15
No. 7, Shell Wheel,	1.75
No. 8, Shell Wheel Box, round side,	.15
No. 9, Feed Wheel Box, flat side,	.15
No. 10, Feed Wheel,	.80
No. 11, Feed Wheel Box, round side,	.15
No. 12, Balance Wheel,	1.75
No. 13, Flat Side,	2.00
No. 14, Round Side,	2.00
No. 15, Handle,	.40
Spring,	.65
Wrench,	.15

PUMP REPAIRS.

In the following lists will be found prices of pieces for all the leading Pumps we make, which dealers will find of decided convenience. In this connection we desire to impress most emphatically on the minds of dealers that all our threads are cut to exact and accurate gauges; all holes in flanges, etc., drilled to templets; all castings made from metal patterns, similar parts being always the same. Therefore, repairs will invariably take the place of the broken parts.

Levers or Handles.

Cistern Pumps, Figs. 198, 199, 200, 201, 202½ and 210—Nos. 0, 1 and 2,...$ .50
No. 3,..... .60
No. 4,..... .70
No. 5,..... 1.00
No. 6,..... 1.25
No. 8,..... 1.50
Pitcher Pumps, Figs. 205, 205½, 208 and 209—Nos. 1, 2, 3 and 4,..... .60
No. 5,..... .75
"Star" Well Pumps, Figs. 206 and 207—Nos. 1 and 2, ... .75
Nos. 3, 4 and 5,..... .85
"Star" Well Pump, Tight Top, Fig. 234—Nos. 2 and 3, ... .90
Nos. 4 and 5, ... 1.25
"1885" Well Pumps, Fig. 550,..... 1.00
Figs. 551 and 552,..... 1.25
Fig. 553, ... 1.25
Figs. 554 and 555,..... 1.40
Drive Well Pumps, Figs. 517, 212 and 215,..... 1.00
Yard Well Pumps, Figs. 225, 227, 235 and 486,..... 1.50
Well Force Pumps, Fig. 240,..... 1.50
Figs. 242 and 245,..... 1.75
Fig. 699,..... 1.25
"1885" Well Force Pumps, Figs. 424, 425 and 426, ...$1.40
Deep Well Pumps, Figs. 236 and 237,. 1.75
Figs. 592 and 593,..... 2.75
Wind Mill Pumps, Figs. 585, 543, 580, 594, 447, 522, 669, 691, 738, 670 and 736—6 inch stroke,..... 1.50
to inch stroke,..... 1.75
Fig. 762—No. 3..... 1.25
Nos. 4 and 5, ... 1.40
Figs. 422 and 423,..... 1.40
Figs. 401, 402, 412 and 413, ... 1.40
Figs. 764 and 765,..... 2.00
"Pacific" Force Pumps, Figs. 674 and 601—Nos. 2 and 4, ... 1.50
Nos. 6 and 8, ... 2.00
"Pacific" Force Pumps, Double Acting, Figs. 638 and 629, ... 2.00
Hand Force Pumps, Figs. 390 to 399—
Nos. 2 and 4, ... 1.00
Nos. 6 and 8, ... 1.50
House Force Pumps, Single Acting, Figs. 440, 441, 442, 480, 481 and 281, 2.00
House Force Pumps, Double Acting, Figs. 271, 272 and 273—
Nos. 0, 1, 2, 3 and 4,..... 2.00
Nos. 6, 8 and 10,.. ..... 3.00
Hand Boiler Pumps, Figs. 289 and 495, 2.00

Plungers, with Rods.

Cistern Pumps, Figs. 198, 199, 200, 201 and 202½—No. 0, 2 inch,.....$ .70
No. 1, 2¼ inch,..... .75
No. 2, 2½ inch,..... .80
No. 3, 2¾ inch,..... .90
No. 4, 3 inch,..... 1.00
No. 5, 3¼ inch,..... 1.15
No. 6, 3½ inch,..... 1.30
No. 8, 4 inch,.....$1.50
Pitcher Pumps, Figs. 205, 205½, 208 and 209—No. 1, 2½ inch,..... .80
No. 2, 3 inch,..... 1.00
No. 3, 3½ inch,..... 1.30
No. 4, 4 inch,..... 1.50
No. 5, 4½ inch,..... 1.75

Plungers Only, no Rods.

Well Lift and Force Pumps. See Cylinder Plungers, only, "A" style, page 254.

"Pacific" Force Pumps, Figs. 674 and 601—Nos. 2 and 4, 2½ and 3 inch,$1.00
No. 6, 3½ inch,..... 1.25
No. 8, 4 inch,..... 1.50

"Pacific" Force Pumps, Double Acting, Figs. 638 and 629,..... 1.00

Hand Force Pumps, Figs. 390 to 399—Nos. 0, 2 and 4, sizes 2, 2½ and 3 inch,..... 1.00
No. 6, 3½ inch,..... 1.50
No. 8, 4 inch,..... 1.50
House Force Pumps, Single Acting, Figs. 440, 441, 442, 480, 481, 281, 449, 712, 713 and 466—Nos. 0, 2, 3 and 4, sizes 2, 2½, 2¾ and 3 inch,..$1.00
Nos. 5 and 6, sizes 3¼ and 3½ inch. 1.50
Railroad Force Pumps, Figs. 278 and 279—No. 8, 4 inch,..... 1.50
No. 12, 5 inch,..... 3.00
House Force Pumps, Double Acting, Figs. 271, 272, 273, 450, 451 and 452—Nos. 0, 1, 2, 3 and 4, sizes 2, 2¼, 2½, 2¾ and 3 inch,..... 1.00
No. 6, 3½ inch,..... 1.25
No. 8, 4 inch,..... 1.50
No. 10, 4½ inch,..... ..... 2.50
Hand Boiler Pumps, Figs. 289 and 495, 2.75

Fulcrums or Bearer Tops.

Cistern Pumps, Figs. 198, 199, 200, 201, 202½ and 210—Nos. 0, 1 and 2....$ .70
No. 3,..... .75
No. 4,..... .80
No. 5,..... .90
No. 6,..... 1.10
No. 8,..... 1.50
Pitcher Pumps, Figs. 205, 208 and 209, Open Top—Nos. 1 and 2,..... .40
Nos. 3 and 4, ... .50
No. 5,..... .60
Figs. 205½, 208 and 209, Close Top, No. 1,..... .60
No. 2,..... .70
No. 3,..... .85
No. 4,..... .95
"Star" Well Pumps, Figs. 206 and 207—Nos. 1 and 2, ... .75
Nos. 3 and 4, ... .80
No. 5,..... .90
"Star" Well Pump, Tight Top, Fig. 234—Nos. 2 and 3,..... 1.25
No. 4,..... 1.35
No. 5,..... 1.50
"1855" Well Pumps, Fig. 550, ... .90
Figs. 551 and 552,..... 1.10
Fig. 553,..... 1.25
Figs. 554 and 555,..... 1.35
Drive Well Pumps, Figs. 212 and 215,. .80
Fig. 517,..... 1.25
Yard Well Pumps, Figs. 225, 227 and 235,..... 1.50
Well Force Pumps, Figs. 242 and 699,. 1.25
Figs. 240 and 245,..... 1.50
"1885" Well Force Pumps, Figs. 424, 425 and 426, ... 1.50
Deep Well Pumps, Figs. 592 and 593, 3.00
Wind Mill Pumps, Figs. 447, 585 and 543—6 inch stroke, ...$1.50
10 inch stroke,..... 2.00
Figs. 580, 594, 669, 691 and 738, 6 inch stroke,..... 2.00
10 inch stroke, ... 2.50
Fig. 412—6 inch stroke,..... 1.35
10 inch stroke, ... 1.50
Figs. 401, 402 and 413—
6 inch stroke,..... 1.50
10 inch stroke, ... 1.75
Fig. 762—No. 3, 6 inch stroke,.... 1.25
Nos. 4 and 5, 6 inch stroke,..... 1.35
Nos. 4 and 5, 10 inch stroke,..... 1.50
Figs. 422 and 423—6 inch stroke,.. 1.50
10 inch stroke, ... 1.75
Figs. 764 and 765—6 inch stroke,.. 3.50
10 inch stroke, ... 4.25
"Pacific" Force Pumps, Figs. 674 and 601—Nos. 2 and 4, ... 2.00
Nos. 6 and 8, ... 3.50
"Pacific" Force Pumps, Double Acting, Figs. 638 and 629,..... 2.00
Hand Force Pumps, Figs. 390 to 399, Nos. 0 and 2, ... 1.25
No. 4,..... 1.50
Nos. 6 and 8, ... 1.75
House Force Pumps, Single Acting, Figs. 440, 441, 442, 480, 481 and 281, 2.00
House Force Pumps, Double Acting, Figs. 271, 272 and 273, Nos. 0, 1, 2, 3 and 4, ... 2.00
Nos. 6, 8 and 10,..... 2.50
Hand Boiler Pumps, Figs. 289 and 495 Nos. 0 and 2, ... 1.25
No. 4,..... 1.50

Bases and Bottom Caps.

Cistern Pumps, Figs. 198, 199, 200, 201 and 210, Bases—Nos. 0, 1 and 2,..$ .75
No. 3,..... .85
Nos. 4 and 5, ... 1.00
No. 6,..... 1.25
No. 8,..... 1.75
Fig. 202½, Bottom Caps, Nos. 0, 1, 2, 3 and 4,..... .50
Nos. 5 and 6, ... .75
No. 8,..... 1.00
Pitcher Pumps, Figs. 205, 205½ and 209, Bases—No. 1, ... 1.00
No. 2,..... 1.10
No. 3,..... 1.25
No. 4,..... 1.50
No. 5,..... 1.75
Ditto for Brass Valve Seats—No. 1, ... .80
No. 2,..... .90
No. 3,..... 1.00
No. 4,..... 1.15
No. 5,..... 1.50
Fig. 208, Vacuum Base—No. 1, ... 1.60
No. 2,..... 1.75
No. 3,..... 2.00
"Star" Well Pumps, Figs. 206, 207 and 234—Nos. 1 and 2, ... .75
No. 3,..... .85
Nos. 4 and 5, ... 1.00
Drive Well Pumps, Figs. 212 and 215,. 1.00
Yard Well Pumps, Figs. 225 and 227, 1.50
Well Force Pumps, Figs. 242, 245 and 699,..... 1.25
Fig. 240, ... 1.50
"Pacific" Force Pumps, Fig. 674, Bases—Nos. 2 and 4,.....$2.00
Nos. 6 and 8, ... 2.25
Fig. 601, Bottom Caps, Nos. 2 and 4, ... .75
Nos. 6 and 8, ... 1.25
"Pacific" Force Pumps, Double Acting, Fig. 638, Bases—No. 2,..... 2.25
No. 4,..... 2.50
Fig. 629, Bottom Caps—No. 2,.... .75
No. 4,..... 1.00
Hand Force Pumps, Figs. 390, 392, 394, 396, 398 and 264, Bases, Nos. 0 and 2, ... 1.10
No. 4,..... 1.25
No. 6,..... 1.75
No. 8,..... 2.00
Figs. 391, 393, 395, 397 and 399, Bottom Caps—Nos. 0, 2 and 4,.... .50
No. 6,..... .85
No. 8,..... 1.50
House Force Pumps, Single Acting, Figs. 440, 441, 442, 714, 480, 481, 281, 449, 712, 713, 466, etc. Bottom Caps—Nos. 0, 2, 3 and 4,..... 1.00
Nos. 5 and 6, ... 1.25
House Force Pumps, Double Acting, Figs. 271, 272, 273, 450, 451, 452, etc., Bottom Caps, Nos. 0, 1, 2, 3 and 4,..... 1.50
No. 6,..... 1.75
No. 8,..... 2.25
No. 10,..... 2.75

Cylinders, Only.

Cistern Pumps, Figs. 198, 199, 200, 201, 202½ and 210—No. 0, 2 inch,.....$1.45
No. 1, 2¼ inch,..... 1.60
No. 2, 2½ inch,..... 1.80
No. 3, 2¾ inch,..... 1.90
No. 4, 3 inch,..... 2.25
No. 5, 3¼ inch,..... 2.40
No. 6, 3½ inch,..... 3.00
No. 8, 4 inch,..... 4.00
Pitcher Pumps, Figs. 205, 205½, 208 and 209—No. 1, 2½ inch,..... 1.50
No. 2, 3 inch,..... 1.75
No. 3, 3½ inch,..... 2.00
No. 4, 4 inch,..... 2.25
No. 5, 4½ inch,..... 2.50
"Pacific" Force Pumps, Figs. 674 and 601—Nos. 2 and 4, sizes 2½ and 3 inch,..... 5.00
No. 6, 3½ inch,..... 7.00
No. 8, 4 inch,..... 8.00
"Pacific" Force Pumps, Double Acting, Figs. 638 and 629,
No. 2, 2½ inch,..... 7.00
No. 4, 3 inch,..... 8.00
Hand Force Pumps, Figs. 390 to 399—
No. 0, 2 inch,..... 3.00
Nos. 2 and 4, sizes 2½ and 3 inch,. 4.00
No. 6, 3½ inch,.....$6.00
No. 8, 4 inch,..... 6.50
House Force Pumps, Single Acting, Figs. 440, 441, 442, 480, 481, 281, 449, 712, 713, 466, etc., No. 0, 2 inch, 3.50
No. 2, 2½ inch,..... 4.00
No. 3, 2¾ inch,..... 4.25
No. 4, 3 inch,..... 4.50
No. 5, 3¼ inch,..... 5.00
No. 6, 3½ inch,..... 6.00
Railroad Force Pumps, Figs. 278 and 279—No. 8, 4 inch,..... 7.50
No. 12, 5 inch,.....10.00
House Force Pumps, Double Acting, Figs. 271, 272, 273, 450, 451, 452, etc.—Nos. 0 and 1, sizes 2 and 2¼ inch,..... 4.00
No. 2, 2½ inch,..... 5.50
No. 3, 2¾ inch,..... 6.00
No. 4, 3 inch,..... 6.50
No. 6, 3½ inch,..... 8.00
No. 8, 4 inch,.....11.00
No. 10, 4½ inch,.....14.00
Hand Boiler Pumps, Figs. 289 and 495
No. 0, 2 inch,..... 3.00
Nos. 2 and 4, sizes 2½ and 3 inch,. 4.00

Stocks or Standards, Complete.

"Star" Well Pumps, Figs. 206 and 207
No. 1,.....$3.75
No. 2,..... 4.25
No. 3,..... 4.50
No. 4,..... 5.00
No. 5,..... 5.25
"Star" Well Pump, Tight Top, Fig. 234—No. 2,..... 5.00
No. 3,..... 5.25
No. 4,..... 5.75
No. 5,..... 6.00
"1885" Well Pumps, Fig. 550, ... 5.50
Fig. 551,..... 6.00
Fig. 552,..... 6.50
Fig. 553,..... 7.00
Fig. 554, ...$7.50
Fig. 555,..... 8.00
Drive Well Pumps, Figs. 212 and 215,. 5.00
Fig. 517,..... 5.50
Yard Well Pumps, Fig. 225,..... 9.00
Fig. 227—No. 5, ... 8.00
Fig. 227—No. 7, ... 8.50
Well Force Pumps, Fig. 240,. 13.00
Fig. 242,.....10.00
Fig. 245,.....12.00
Fig. 699,.....11.00
"1885" Well Force Pumps, Fig. 424, .10.00
Fig. 425,.....11.00
Fig. 426,.....12.50

Stocks or Standards Only.

"Star" Well Pumps, Figs. 206, 207 and 234—No. 1,.....$2.00
No. 2,..... 2.25
No. 3,..... 2.60
No. 4,..... 2.75
No. 5,..... 3.00
"1885" Well Pumps, Fig. 550,..... 3.75
Fig. 551,..... 4.25
Fig. 552,..... 4.75
Fig. 553,..... 3.75
Fig. 554,..... 4.25
Fig. 555,..... 4.75
Drive Well Pumps, Fig. 212,..... 2.50
Fig. 215,..... 2.75
Fig. 517,..... 3.50
Yard Well Pumps, Fig. 225,..... 4.50
Fig. 227—No. 5, ... 4.00
Fig. 227—No. 7, ... 4.50
Fig. 235,..... 5.25
Fig. 486,..... 5.00
Well Force Pumps, Fig. 240,..... 5.00
Fig. 242,..... 4.00
Fig. 245,..... 4.00
Fig. 699,..... 3.60
"1885" Well Force Pumps, Fig. 424,..$4.75
Fig. 425,..... 5.25
Fig. 426,..... 4.75
Deep Well Pumps, Figs. 236 and 237, Top Section,..... 3.00
Bottom Section, ... 4.00
Figs. 592 and 593, Top Section,... 4.00
Bottom Section,..... 6.50
Wind Mill Pumps, Fig. 585—No. 4,... 3.00
No. 5,..... 5.50
Figs. 691 and 738,..... 5.50
Figs. 580 and 401,..... 6.50
Figs. 669 and 413,..... 6.00
Figs. 543 and 412, Top Section,... 2.40
Bottom Section,..... 3.60
Figs. 594 and 402, Top Section,... 2.40
Bottom Section,..... 3.60
Fig. 762—No. 3, ... 3.75
No. 4,..... 4.25
No. 5,..... 4.75
Figs. 422 and 423—No. 1,..... 4.75
No. 2,..... 5.25
Figs. 764 and 765, Top Section,... 4.00
Bottom Section,..... 6.50

Lower Valves.

	2 to 3 in.	3¼ to 4 in.
Cistern Pumps,	$ .25	$ .35
Pitcher Pumps,	.25	.35
Well Lift and Force Pumps	.25	.35
"Pacific" Force Pumps, Single Acting,	.25	.35
Hand Force Pumps,	$ .25	$ .35
House Force Pumps, Single Acting,	.25	.35
Hand Boiler Pumps,	2.00	2.00

Brass Valve Seats.

Cistern Pumps, Figs. 198, 199, 200, 201, 202½ and 210, Nos. 0, 1, 2, 3 and 4,	$ .75
No. 5,	1.00
No. 6,	1.25
No. 8,	1.75
Pitcher Pumps, Figs. 205, 205½ and 209—No. 1,	.75
No. 2,	$ .90
No. 3,	1.10
No. 4,	1.20
No. 5,	1.30
Hand Force Pumps, Figs. 390 to 399— Nos. 0 and 2,	1.00
Nos. 4 and 6,	1.25
No. 8,	1.50

Cylinder Shells or Bodies.

Size, inches,	2¼	2½	2¾	3	3¼	3½	3¾	4
Figs. 609 and 610 (Gas Set),	$1.50	$1.60	$1.80	$2.00	$2.25	$2.50	$2.80	$3.25
Figs. 611 and 612 (Shallow Well),	2.30	2.45	2.45	2.70	3.00	3.25	3.55	3.80
Figs. 613, 614 and 548 (Deep Well),	2.80	3.05	3.30	3.55	3.80	4.05	4.15	4.30
Fig. 620 (Wood Pump),	1.50	1.60	1.80	2.00	2.25	2.50	2.80	3.25

Cylinder Plungers Only, no Rods.

Size, inches,	2¼	2½	2¾	3	3¼	3½	3¾	4
"A" style (Gas Set),	$ .75	$ .80	$ .90	$1.00	$1.15	$1.30	$1.40	$1.50
"B" style (Shallow Well),	2.00	2.10	2.10	2.30	2.45	2.70	2.95	3.20
"C" style (Deep Well),	2.30	2.45	2.70	2.95	3.20	3.45	3.60	3.95
"E" style (Special),	1.00	1.00	1.00	1.25	1.35	1.45	1.60	1.75
"F" style (Wind Mill), Brass,	1.90	2.00	2.15	2.25	2.40	2.50	2.65	2.75
"G" style (Wood Pump),	.75	.80	.90	1.00	1.15	1.30	1.40	1.50
"H" style (Double Acting),	1.00	1.00	1.00	1.00	1.25	1.25	1.50	1.50

Cylinder Top Attachments or Caps.

Figs. 609, 610, 611, 612, 613, 614, 616 and 617—2¼, 2½, 2¾ and 3 in.,	$ .75
3¼, 3½, 3¾ and 4 in.,	$1.00

Cylinder Bottom Attachments or Caps.

Figs. 609, 610, 611, 612, 613, 614, 616 and 617—2¼, 2½, 2¾ and 3 in.,	$1.00
3¼, 3½, 3¾ and 4 in.,	$1.25

Cylinder Lower Valves.

Figs. 609, 610, 611, 612, 613, 614, 616 and 617—2¼, 2½, 2¾ and 3 in.,	$ .25
3¼, 3½, 3¾ and 4 in.,	$ .35

Piston and Connecting Rods.

Well and Wind Mill Force Pumps, Polished Round Iron Rods,	$ .60
Short Flat Rods, for Figs. 422, 423, 401, 402, 413, 580, 594, 669, etc.,	.60
Long Flat Rods, for Figs. 585, 543, 762, 412, etc.,	.75
"Pacific" Force Pumps, Figs. 674 and 601, Short Flat Rods,	.60
Brass Cased Rods—Nos. 2 and 4,	1.00
No. 6,	1.25
No. 8,	1.75
"Pacific" Force Pumps, Double Acting, Figs. 638 and 629, Short Flat Rods,	.60
Brass Cased Rods,	$1.00
Hand Force Pumps, Figs. 390 to 399, Brass Cased Rods, Nos. 0, 2 and 4,	1.00
No. 6,	1.25
No. 8,	1.75
House Force Pumps, Single Acting, Figs. 440, 441, 442, 714, 480, 481, 449, 712, 713, etc., Brass Cased Rods, Nos. 0, 2, 3 and 4,	1.00
Nos. 5 and 6,	1.25
House Force Pumps, Double Acting, Figs. 271, 272, 273, 450, 451, 452, etc., Brass Cased Rods—Nos. 0, 1, 2, 3 and 4,	1.00

Caps and Glands.

	Caps.	Glands.
Well Force Pumps, Figs. 242, 245 and 699,	$ .50	$ .75
Well Force Pump, Fig. 240,	.75	1.00
"1885" Well Force Pumps, Figs. 424, 425 and 426,		1.00
Deep Well Pumps, Fig. 236,	.50	
Fig. 237,	.75	.50
Fig. 592,	.50	
Fig. 593,	.90	.60
Wind Mill Force Pumps, Figs. 580, 594, 669, 691, 738, 401, 402 and 413,		1.00
Figs. 422 and 423,		1.00
Fig. 765,		1.25
"Pacific" Force Pumps, Figs. 674 and 601—Nos. 2 and 4,		1.00
Nos. 6 and 8,		1.25
"Pacific" Force Pumps, Double Acting, Figs. 638 and 629,		1.00

	Caps.	Glands.
Hand Force Pumps, Figs. 390 to 399—No. 0,	$ .50	$ .75
Nos. 2 and 4,	.50	1.00
Nos. 6 and 8,	.75	1.25
House Force Pumps, Single Acting, Figs. 440, 441, 442, 714, 480, 481, 281, 449, 712, 713, 466, etc.		
Nos. 0, 2, 3 and 4,	.65	1.00
No. 5,	.75	1.25
No. 6,	1.00	1.25
House Force Pumps, Double Acting, Figs. 271, 272, 273, 450, 451, 452, etc.		
Nos. 0, 1, 2, 3 and 4,	.65	1.00
No. 6,	1.00	1.25
Nos. 8 and 10,	1.25	1.25
Hand Boiler Pumps, Figs. 289 and 495,	.50	.50

Brass Bowls.

House Force Pumps, Single and Double Acting, Figs. 440, 441, 271, 272, etc., $1.25

Pitmans.

House Force Pumps, Single Acting, Figs. 440, 441, 442, 714, 480 and 281, $1.00

House Force Pumps, Double Acting, Figs. 271, 272, 273 and 452, $1.00

Guides.

House Force Pumps, Single Acting, Figs. 440, 441, 442, 714, etc., $ .75

House Force Pumps, Double Acting, Figs. 271, 272, 273 and 452,
Nos. 0, 1, 2, 3, 4 and 6, $ .75
Nos. 8 and 10, 1.00

Guide Rods.

House Force Pumps, Single Acting, Figs. 440, 441, 442, 714, 480, 281, etc., $ .60

House Force Pumps, Double Acting, Figs. 271, 272, 273 and 452, Nos. 0, 1, 2, 3 and 4, $ .60

Cross Heads, Including Nuts and Set Screws, and Links in Pairs.

	Cross Heads, etc.	Links.
Well Pumps, Figs. 225, 234, 240, 242, 245 and 699,	$ .50	$ .25
Deep Pump Wells, Figs. 592 and 593,	.70	.40

	Cross Heads, etc.	Links.
Hand Force Pumps, Figs. 390 to 399—Nos. 0, 2 and 4,	$ .50	$ .25
Nos. 6 and 8,	.60	.30

Air Chambers.

Well Force Pumps, Figs. 245 and 699,	$3.00
Fig. 240,	3.50
Deep Well Force Pumps, Fig. 237,	3.00
Fig. 593,	4.00
Wind Mill Force Pumps, Figs. 580, 594, 401, 402, 669 and 413,	2.50
Fig. 765,	4.00
"Pacific" Force Pumps, Figs. 674 and 601—Nos. 2 and 4,	2.00
Nos. 6 and 8,	3.00
"Pacific" Force Pumps, Double Acting, Figs. 638 and 629,	2.00
Hand Force Pumps, Figs. 392 to 399—Nos. 0, 2 and 4,	2.00
Nos. 6 and 8,	$3.00
House Force Pumps, Single Acting, Figs. 441, 442, 713, 714, 449, etc., Nos. 0, 2, 3 and 4,	2.00
Nos. 5 and 6,	3.00
House Force Pumps, Double Acting, Figs. 272, 273, 450, 451, 452, etc.— Nos. 0, 1 and 2,	2.00
Nos. 3 and 4,	3.50
No. 6,	5.00
No. 8,	6.50
No. 10,	8.00

Spouts.

Well Pumps, Figs. 242, 486, 236, 422, 424, 425 and 691,.....$ .50
Deep Well Pumps, Figs. 592 and 764,..$ .75

Cast Iron Set Lengths.

Yard Well Pumps, Figs. 206, 223, and 233, 2 feet lengths,.....$1.75
Yard Well Pumps, Figs. 206, 223 and 233, 3 feet lengths,.....$2.25
Figs. 225, 227 and 240, ... 4.50

Braces.

Well and Wind Mill, Lift and Force Pumps, ...$ .50
Deep Well Pumps, Figs 236 and 237,..$ .60
Figs. 592, 593, 764 and 765,..... .75

Iron Pipe Nuts, for Cistern and Pitcher Pumps, Spout and Air Chamber Nuts.

For 1 and 1¼ in. Pipe,.....$ .35
For 1½ in. Pipe,..... .45
For 2 in. Pipe,.....$ .60

Lead Pipe Nuts for Cistern and Pitcher Pumps.

For 1 and 1¼ in. Pipe,.....$ .25
For 1½ in. Pipe,..... .35
For 2 in. Pipe,.....$ .50

Brass Tubes for Iron or Lead Pipe.

For 1 and 1¼ in. Pipe,.....$ .50
For 1½ in. Pipe,..... .75
For 2 in. Pipe,.....$1.00

Base Set Screws and Lever Bolts.

Cistern and Pitcher Pumps,.....$ .08

Bearer Links.

Wind Mill, Lift and Force Pumps, 6 in. stroke,.....$ .50
10 in. stroke,..... .75
Figs. 764 and 765, 6 in. stroke,.....$ .75
10 in. stroke,..... 1.00

Wind Mill Force Pump, with Distributing Valve—Fig. 736.

Standard complete, 6 in. stroke, including Rod and Coupling,.....$8.00
Standard complete, 10 in. stroke, including Rod and Coupling,..... 9.50
Standard only, 6 in. stroke,..... 5.00
10 in. stroke,..... 6.00
Set Length complete, including Pipe and Discharge Part,.....10.00
Platform,..... 2.25
Platform, small Plate,..... .25
Brace,..... .50
Lever, 6 in. stroke,..... 1.50
10 in. stroke,..... 2.00
Bearer Link, 6 in. stroke,..... .50
10 in. stroke, ... .75
Spout, only,..... 1.00
Spout Wheel,.....$ .25
Brass Spout Screw,..... 1.00
Brass Spout Stuffing Box, ... .75
Spout Nut, ... .25
Spout Hose Tube,..... .35
Brass Cased Rod,..... 1.00
Working Head only,..... 2.00
Working Head Cap,..... .40
Working Head Stuffing Box, ... .50
Suction Flange (to fit working head),.. .50
Brass Elbow, ... 1.00
Elbow Nut,..... .35
Attachment to screw Pipe into,..... .60
Disc Valve, Rubber Faced,..... .50
Middle Round Rod, no Coupling, ... .40
Flat Rod and Union Coupling,..... .75

"Syphon" Working Barrel—Fig. 514.

Size, inches,	2½	3	3½	4
Air Chamber,	$6.00	$6.00	$9.00	$9.00
Air Chamber Gland,	1.00	1.00	1.25	1.25
Air Chamber Tube,	.50	.50	1.00	1.00
Check Valve Case only,	1.00	1.00	1.25	1.25
Check Valve Nut,	.50	.50	.75	.75
Check Valve Tube,	1.00	1.25	1.50	2.00
Suction Flange,	.75	1.00	1.25	1.25
Outside Cylinder,	4.00	4.00	5.50	5.50
Bottom Plate,	2.00	2.00	2.50	2.50
Inside Cylinder, Brass Lined,	3.00	3.50	4.00	5.00
Inside Cylinder, for Bottom Attachment,	.75	.85	1.00	1.25
Brass Plunger,	2.50	3.00	3.50	4.00
Brass Valve Seat,	.25	.30	.40	.50
Piston Rod, only,	1.25	1.25	1.50	1.50

"Alert" Double Acting Force Pumps—Figs. 747 and 769.

Nos	2	4	6	8
Cylinder,	$4.50	$5.50	$7.00	$9.00
Valve Plate,	2.00	2.00	3.00	3.00
Air Chamber,	2.50	2.50	3.50	3.50
Lever, for Fig. 747,	1.50	1.50	1.50	1.50
Link, " "	.50	.50	.75	.75
Front Head,	1.25	1.50	1.75	2.25
Back Head,	.75	1.00	1.25	1.75
Iron Cross Head,	.35	.35	.50	.50
Plunger with Leathers,	1.25	1.50	2.00	2.50
Brass Gland,	.40	.40	.50	.50
Brass Cap,	.75	.75	.75	.75
Brass Air Chamber Nut,	.60	.60	.75	.75
Brass Drip Plugs,	.30	.30	.30	.30
Brass Cased Rod,	1.00	1.00	1.25	1.25
Leather Suction Valve,	.50	.50	.75	.75
Leather Discharge Valve,	.50	.50	.75	.75
1 in. Pipe Plug,	.25	.25	.30	.30
1¼ in. Pipe Plug,	.30	.30	.40	.40
Crimped Packings.,	.30	.30	.30	.40

"Challenge" Double Acting Force Pumps—Figs. 470, 494, 562, 581, 582, 603, 604, Etc.

Nos	2	4	8	12	16
Cylinder, with 2 Valve Seats and 2 Bushings,	$11.00	$11.00	$11.00	$20.00	$25.00
Bed Plate, with 2 Valve Seats,	4.00	4.00	4.00	7.50	9.00
Air Chamber,	1.50	1.50	2.00	4.00	5.00
Piston Rod, excepting Figs. 603 and 604,	1.50	1.50	1.50	2.00	2.00
Piston complete, with Leathers,	2.00	2.00	2.00	3.50	4.00
Front Cylinder Head,	1.00	1.00	1.00	3.00	4.00
Back Cylinder Head,	.90	.90	.90	2.75	3.75
Stuffing Box Cap, Brass,	.50	.50	.50	1.00	1.25
Stuffing Box Gland,	.40	.40	.40	.75	.85
Poppet Valves, Hard Brass, each,	.50	.50	.50	.80	1.00
Leather Valves, each,	1.25	1.25	....	....	....
Lever Socket,	.75	.75	.75	1.25	1.25
Wrought-Iron Lever and Wood Handle, each,	1.50	1.50	1.50	2.00	2.00
Horseshoe Link,	.25	.25	.25	.35	.35
Suction Hose, ½ Coupling,	.55	.55	.78	1.33	2.67
Discharge Hose, ½ Coupling,	.50	.50	.55	.78	1.33
Long Bolt, for Horseshoe, each,	.25	.25	.25	.30	.40
Lever Bolt, each,	.15	.15	.15	.20	.20
Crimped Leather Packings, each,	.30	.30	.40	.60	.70
Brass Bushings, for Discharge,	1.00	1.00	1.00	1.25	1.50
Brass Bushings for Suction,	1.00	1.00	1.00	1.50	2.25
Iron Pipe Nuts,	.50	.50	.50	.60	.75
Lead Pipe Elbows and Unions, each,	1.25	1.50	1.50	....	....
Brass Thumb Screws,	.25	.25	.25	.35	.35

"Royal" Independent Steam Boiler Feed Pump—Fig. 687.

Nos.	1	2	3	4	5	6
Base,	$3.00	$3.50	$4.00	$4.00	$5.00	$6.00
Frame and Caps, including Pump Cylinder,	10.00	11.00	12.50	14.00	18.00	30.00
Water Piston and Steam Piston Rod, with Link,	7.50	8.00	9.00	10.00	11.00	15.00
Steam Cylinder,	6.00	7.00	8.00	10.00	12.00	15.00
Steam Cylinder Head,	1.50	2.00	2.50	3.00	3.50	4.00
Steam Piston, Spring Packed,	4.00	4.50	5.00	5.50	7.00	9.00
Piston Nut,	.75	.75	.75	.80	.85	1.00
Steam Chest and Bonnet, complete,	4.00	4.50	5.00	5.50	6.50	7.50
Steam Chest, only,	2.00	2.25	2.50	2.75	3.25	3.75
Crank Shaft, with Eccentric,	5.00	5.50	6.50	8.00	9.00	11.00
Eccentric Strap,	1.00	1.25	1.50	1.75	2.00	2.50
Steel Crank Pin and Roller,	2.00	2.25	2.50	3.00	3.50	4.25
Steel Roller, only,	1.00	1.12	1.25	1.50	1.75	2.12
Balance Wheel,	6.00	7.00	9.50	11.00	13.00	17.00
Steam Cylinder Stuffing Box Gland,	1.50	1.75	2.00	2.25	2.50	3.00
Water Cylinder Stuffing Box Gland,	1.50	1.75	2.00	2.25	2.50	3.00
Bronze Globe Suction Valve,	3.50	3.50	5.00	7.50	7.50	13.00
Bronze Globe Discharge Valve,	3.50	3.50	5.00	7.50	7.50	13.00
Caps for Valves,	1.00	1.00	1.20	1.25	1.50	1.50
Slide Valves,	.80	1.00	1.50	1.75	2.00	2.50

Hand Rotary Force Pumps—Figs. 297 and 297 1-2.

Nos.	1	2	3	4	5
Case, Cover and Stuffing Boxes,	$8.00	$9.00	$10.00	$15.00	$17.00
Cams, each,	3.50	4.00	4.50	6.00	6.50
Base, including Leather Valve,	3.00	3.00	3.50	6.00	7.00
Spout and Cap,	1.00	1.00	1.50	2.00	2.50
Balance Wheel, Fig. 297, 14½ in. diameter,	1.00	1.00	1.00	....	....
Balance Wheel, Fig. 297½, 20 in. "	2.00	2.00	2.00	3.00	3.00
Balance Wheel, Fig. 297½, 36 in. "	....	....	....	6.00	6.00

Extras, when sent Separate.

Nos.	1	2	3	4	5
Leather Valves, each,	$ .25	$ .25	$ .25	$ .50	$ .50
Stuffing Box and Tight Caps, each,	.35	.35	.35	.35	.35
Brass Thumb Screws, each,	.25	.25	.25	.25	.25
Round Head Machine Screws, each,	.03	.03	.03	....	....
Square Head Machine Screws, each,	.04	.04	.04	.04	.04

These prices apply to extras for Fig. 298.

Fig. 298.

Nos.	1	2	3	4	5
Case, Cover, Stuffing Boxes and Caps,	$8.00	$9.00	$10.00	$15.00	$17.00
Cam, with Short Shaft,	3.50	4.00	4.50	6.00	6.50
Cam, with Long Shaft,	5.00	5.50	6.00	7.50	8.00
Small Base,	1.50	1.75	1.75	....	....
Bed Plate,	4.00	4.50	5.00	7.00	8.00
Valve Seat,	....	....	....	1.50	1.50
Spout and Cap,	1.00	1.00	1.50	2.00	2.50
Pulleys, each,	2.00	2.50	3.00	4.00	4.00
Outside Bearing,	1.00	1.25	1.25	2.00	2.50

Extras same as under Figs. 297 and 297½.

"Deluge" Bilge Pump—Fig. 722.

Cylinder, brass lined,	$18.00	Small Steel Pin,	$ .75
Plunger, complete, including Valve,	5.00	Lever Socket,	1.50
Plunger Valve, only,	1.00	Wrought Iron Lever,	3.50
Lower Valve,	1.00	Packing for Plunger Valve,	.30
Large Steel Pin,	1.00	Packing for Lower Valve,	.20

Hydraulic Ram—Fig. 345.

Nos.	2	3	4	5	6	7	8
Brass Impetus Valve and Case,	$4.00	$5.00	$6.00	$10.00	$15.00	$20.00	$25.00
Brass Impetus Valve, only,	2.00	2.50	3.00	5.00	7.50	10.00	12.50
Brass Impetus Case, only,	2.00	2.50	3.00	5.00	7.50	10.00	12.50

Steel Amalgam Bells—Fig. 352.

Nos	1	2	3	4	5
Bell, only,	$4.00	$5.00	$6.50	$9.00	$13.00
Yoke,	.80	1.00	1.15	1.25	2.50
Frame,	1.25	1.50	2.00	2.25	3.50
Clapper,	.50	.50	.75	.75	1.00
Crank,	.10	.15	.15	.20	.25

Fig. 353.

Nos	5	6	7	8
Bell, only,	$13.00	$28.00	$35.00	$45.00
Standards, each,	1.50	2.00	2.50	5.00
Yoke,	3.00	4.00	5.00	7.50
Wheel,	2.00	2.50	2.75	4.75
Wood Frame, only,	3.00	3.50	3.50	5.00
Clapper,	1.00	1.25	1.50	2.25
Jaw, with Flange,	....	....	....	1.20
Jaw, without Flange,	....	....	....	1.00
Sheave,	.50	.50	.50	.50

"Star" Hydrants and Street Washers—Figs. 646 and 647.

	For ¾ in.	For 1 in.
Brass Screw, only,	$ .75	$ .75
Brass Valve Case Nut and Tube,	3.05	4.25
Brass Valve Case, only,	1.75	2.65
Brass Plunger Valve, only, with Packing,	1.00	1.50
Bottom part of Plunger Valve,	.75	.90
Plunger Valve Packing,	.25	.25
Brass Nut for Plunger Valve,	.20	.20
Brass Tube, for Iron or Lead Pipe,	.70	.85
Brass Swivel Nut,	.60	.75
Bottom Attachment,	.75	.90
Bottom Cap,	.25	.30
Stock, complete, for Hydrant, Fig. 646,	4.40	4.40
Stock, only, " "	3.00	3.00
Spout, only, " "	.40	.50
Flange, for Spout, " "	.10	.10
Wheel, only, " "	.25	.25
Top Cap, " "	.50	.50
Bolt, for Top Cap, " "	.10	.10
Malleable Elbow, " "	.40	.50
Case and Cover, for Street Washer, Fig. 647,	1.50	1.50
Cover, only, " "	.40	.40
Inside Plate, " "	.25	.25
Screws to fasten Inside Plate, for Street Washer, Fig. 647,	.10	.10
Keys, " "	.30	.30

INDEX TO FIGURES.